maier heidenheim

Installation Accessories





Contents

	Page
Information on Design and Mounting	4 – 7
Journal Flanges for K Rotor Connection	8 – 9
Flanges for Housing Connection, Sealing in Thread	10
Loose Flanges for Housing Connection, Sealing with Sealing Rings	11
Custom-Made Parts for Rotary Joint Installation	12 – 22
Custom-Made Inner Pipes for Rotary Joints	23 – 24
Threaded Fittings	25 – 29
Metal Hoses	30 – 37
Other Accessories	38
Lubrication Instructions for Rotary Joints	39
Technical Appendix	40 – 43











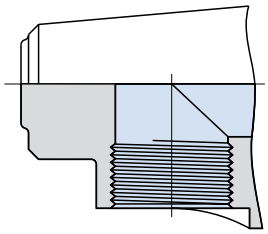


Information on Design and Mounting

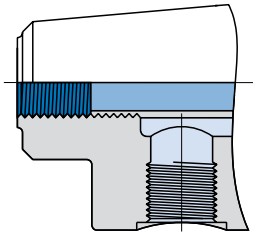
Housing Connections

Housing connections with BSP right-hand thread ISO 228. Adapter pieces for other connections such as ISO 7 threads (NPT) are available. Special versions with flanges. Certain designs with flanges.

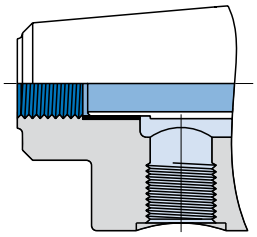
Design 1
Housing with one connection for medium inlet or outlet.



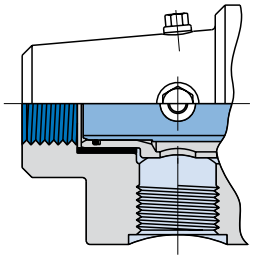
Design 2
Housing with two connections for medium inlet and outlet. For fixed inner pipe which is screwed in half of the thread length.



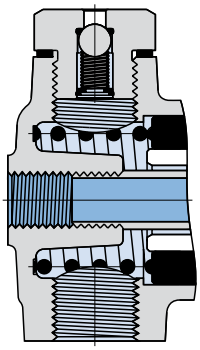
Design R2
Housing with two connections for medium inlet and outlet. For rotating inner pipe. Gap seal between inlet and outlet by means of self-lubricating slide bearing.



Design A2, B2
Housing with two connections for medium inlet and outlet. For rotating inner pipe which is statically supported in the rotor. A2: additional seal for complete isolation of inlet and outlet. B2: Gap seal.

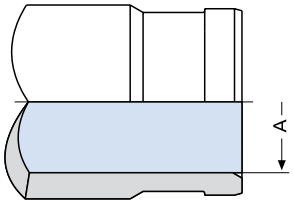


Design 3
Housing with three connections for inlet of steam, outlet of condensate and integrated vacuum breaker as vacuum safety device for thin-walled drying cylinders.



Nominal Diameter

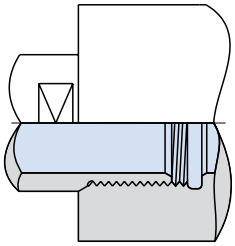
The nominal diameter DN of the rotary joint refers to the bore of the rotary joint rotor and corresponds approximately to its inner diameter (Dimension A). The different nominal diameters comply with DIN 2402.



Rotor connections

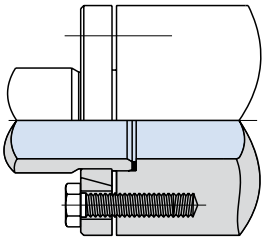
R/L

Design R/L
Connection to rotating pressure system by means of connection piece with male thread ISO 228 with right-hand thread (R) or left-hand thread (L). Sealing and centering cone at the end of the thread. This assures sufficient sealing without additional sealing tape as well as centering with a mating cone. Series DP rotary joints are sealed with a copper sealing ring.
If the thread direction and the direction of rotation of the rotor are identical, the rotor must be secured against coming loose. Adapters for different connections such as ISO 7 threads (NPT) and others are available.



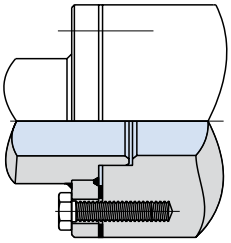
K

Design K
Connection to the rotating pressure system by means of quick release flange, conical and split inner ring and flat packing. Centering via outer diameter of rotor. Adapter rings are required in the case of different centering diameters (available as accessories).
Version K is independent of the direction of rotation.



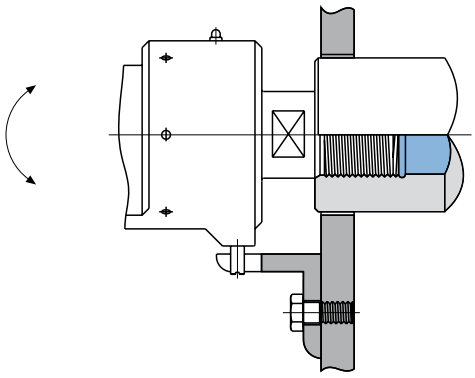
F

Design F
Connection to rotating pressure system by means of fixed flange; especially suited for greater speeds. Version F is independent of the direction of rotation.



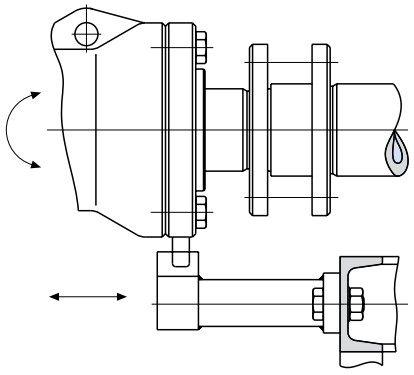
Protection against rotation

All rotating seals generate friction torque which primarily depends on the design of the seal and the operating pressure. Therefore, the fixed part of the rotary joint has to be prevented from rotating. This is achieved by means of a locking device on the housing and an interfering support element. The dimension tables for the individual series list the respective dimensions. It is important to provide sufficient clearance between the locking device and the support element in both radial and axial directions.

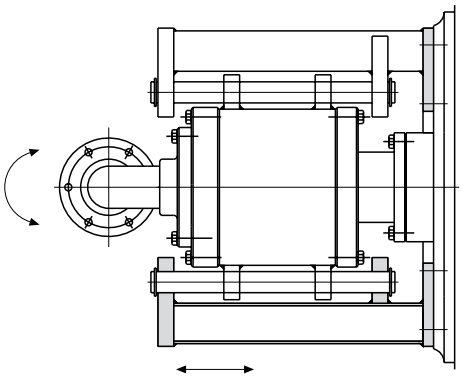


Series DX rotary joints with small diameters are secured sufficiently via the hose connection. Nominal diameters 40 mm and above require a locking pin or a locking fork. Due to the low friction torque, series DP rotary joints do not require an anti-rotation device.

Series M and H rotary joints have a greater friction torque; they have to be secured by means of an anti-rotating fork. The wear of the sealing ring of series H rotary joints results in an axial displacement of the housing (away from the roller) of up to 15 mm. The locking mechanism must not obstruct this displacement since otherwise leakage or excessive wear and tear will result.



It is not recommended to connect several H rotary joints by means of a fixating bar via the upper housing bore. If wear is not exactly identical for all seals of such a combination, tension will result which in turn causes leakage or increased wear and tear. In addition, you will not be able to use the entire wear allowance provided for by the seal design.
Series DA rotary joints provide four lugs for rods which are also used for mounting the joint. The tables for series DA also show the required rod sizes. The rods must be fixated (e.g. via sufficiently rigid bracket) in such a way that the housing and the rotor are centered. The wear at the sealing ring causes an axial displacement of the housing (away from the roller) of up to 20 mm. The rods must not obstruct this displacement since otherwise leakage or excessive wear and tear will result.



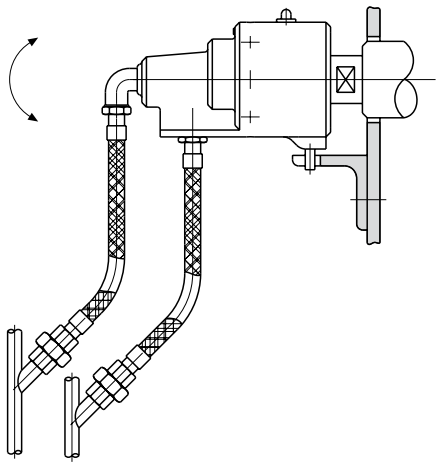
Attention: It is absolutely essential to prevent tension forces. Therefore, ensure that the rotary joint is free to move in all directions (see the arrows in the illustrations).

Flexible connection between rotary joint and pipe system

Maier rotary joints are the interfaces between the fixed and rotating parts of the pressure system. The strain in this element is often underestimated or incorrectly calculated. The loads on the hose caused by the pressure of the medium have an adverse effect on the joint if the hoses are not arranged properly. The same applies to heat expansion, vibration and shocks generated by the roller, contaminated media and constraints caused by insufficient concentricity (roller – rotary joints – inner pipe) are in addition unfavorable factors.

The wear of the sealing rings of series H and DA rotary joints results in an axial displacement of the housing (away from the roller) of up to 15 mm. Hoses or compensators must not interfere with this movement since otherwise leakage results or wear and tear increases.

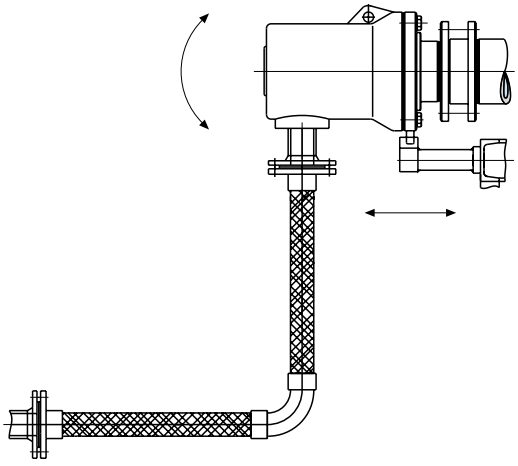
Rotary joints must never be connected directly to fixed pipes so that the bearings are not exposed to uncontrollable loads.



Flexible metal hoses

If flexible metal hoses are used, the smallest allowable bend radius has to be observed.

Torsional, tensile or pressure loads must not be applied. The radius and the direction of movement always have to be in the same plane. We recommend angular (elbow) hoses for nominal diameters of 80 and above since their ability to compensate for the movement of the housing of the rotary joint is superior to that of other hoses.



Journal Flanges for K Rotor Connection



DN	K flange	Order No.	Inner ring	Order No.	Flat pack. Order No.	Ø A	Ø AD	Ø LK	AZ x Ø DB	Ø KD	Ø ID H8/h8	KB	Ø K G7/h8	O	EB
10	KF 10-0	1190430	IR 10-0	1190400	3512230	10	55	40	4x7	20	17	10	18	6	11
15	KF 15-0	1190431	IR 15-0	1190401	3512231	13	70	50	4x9	26	22	10	24	6	11
20	KF 20-0	1190432	IR 20-0	1190402	3512232	20	75	55	4x9	32	28	12	30	8	13
25	KF 25-0	1190433	IR 25-0	1190403	3512233	25	80	60	4x9	37	33	12	35	8	13
32	KF 32-0	1190434	IR 32-0	1190404	3512234	32	100	75	4x11	48	43	12	45	8	13
32	KF 32-500	1190434-500	IR 32-500	1190404-500	3512234	32	115	90	4x11	48	43	15	45	15	16
40	KF 40-0	1190435	IR 40-0	1190405	3512235	38	105	80	4x11	53	48	15	50	10	16
40	KF 40-500	1190435-500	IR 40-500	1190405-500	3512235	38	120	95	4x11	53	48	18	50	20	20
50	KF 50-0	1190436	IR 50-0	1190406	3512236	50	130	100	4x14	69	63	15	65	10	16
50	KF 50-500	1190436-500	IR 50-500	1190406-500	3512236	50	145	115	4x14	69	63	20	65	25	22
65	KF 65-0	1190437	IR 65-0	1190407	3512237	66	150	120	4x14	89	82	15	85	10	16
65	KF 65-500	1190437-500	IR 65-500	1190407-500	3512237	66	165	135	4x14	89	82	25	85	25	28
65	KF 65-37	1190437-037	IR 65-0	1190407	3512237	66	150	120	6x14	89	82	15	85	25	28
75	KF 75-0	1190440	IR 75-0	1190420	1190191-058	67	203	171,5	5x17,5	89	84,2	31	87,29	22,2	
80	KF 80-0	1190438	IR 80-0	1190408	3512238	81	180	145	4x18	109	102	18	105	12	20
80	KF 80-500	1190438-500	IR 80-500	1190408-500	3512238	81	205	170	4x18	109	102	30	105	30	34
100	KF 100-0	1190439	IR 100-0	1190409	3512239	98	195	160	6x18	120	110	20	114	12	22
100	KF 100-500	1190439-500	IR 100-500	1190409-500	3512239	98	220	185	6x18	120	110	30	114	30	34
125	KF 125-0	1190450	IR 125-0	1190410	1190025	120	225	190	6x18	147	137	22	142	20	25
125	KF 125-500	1190450-500	IR 125-500	1190410-500	1190035	120	260	225	8x18	155	145	35	150	35	39
150	KF 150-0	1190451	IR 150-0	1190411	1190026	145	255	220	8x18	178	165	25	170	25	28
150	KF 150-500	1190451-500	IR 150-500	1190411-500	1190036	145	300	260	8x18	185	175	40	180	40	44
200	KF 200-0	1190452	IR 200-0	1190412	1190027	195	310	275	8x18	232	220	28	225	30	32
200	KF 200-500	1190452-500	IR 200-500	1190412-500	1190037	195	360	320	8x18	235	224	45	230	45	49
250	KF 250-0	1190453	IR 250-0	1190413	1190028	240	390	350	8x23	290	273	37	280	35	40
250	KF 250-500	1190453-500	IR 250-500	1190413-500	1190038	240	435	390	8x23	295	278	50	285	50	54
300	KF 300-0	1190454	IR 300-0	1190414	1190029	295	470	410	16x23	350	332	42	340	40	45

Versions KF…-0 and IR…-0:

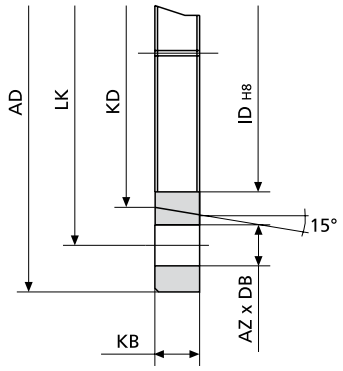
DX/DXS	DN 10 – 80
DXSB	DN 50 – 80
DP	DN 40 – 50
H/HW	DN 15 – 100
HWB/A)[1]	DN 32 – 100
M	DN 15 – 100
DA	DN 50 – 300

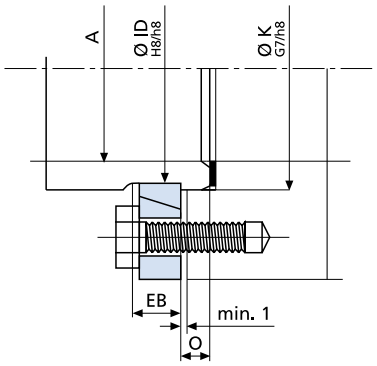
Versions KF…-500 and IR…-500:

DXSB	DN 100 – 150
HWA	DN 100 – 300
DQ	DN 25 – 150

)[1] KF65-0 only up to 210°C, 20 bar or 300°C, 10 bar. For higher data use KF 65-37.

It is important to evenly tighten the screws.





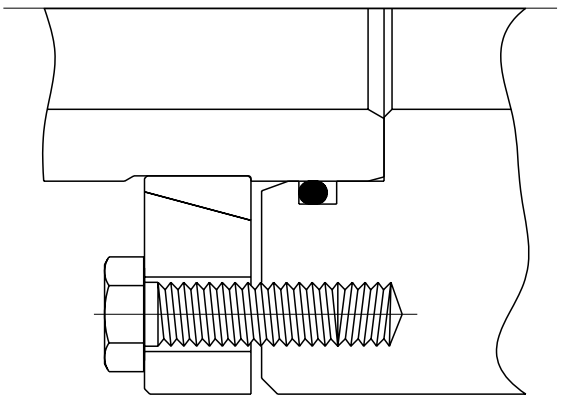
Series DQ

DN	K flange	Order No.	Inner ring	Order No.	Flat pack. Order No.	Ø A	Ø AD	Ø LK	AZ x Ø DB	Ø KD	Ø ID H8/h8	KB	Ø K G7/h8	O	EB
25	KF 32-500	1190434-500	IR 32-500	1190404-500	3512234	25	115	90	4x11	48	43	15	45	20	16
32	KF 40-500	1190435-500	IR 40-500	1190405-500	3512235	32	120	95	4x11	53	48	18	50	25	20
40	KF 50-500	1190436-500	IR 50-500	1190406-500	3512236	38	145	115	4x14	69	63	20	65	25	22
50	KF 65-500	1190437-500	IR 65-500	1190407-500	3512237	50	165	135	4x14	89	82	25	85	30	28
65	KF 80-500	1190438-500	IR 80-500	1190408-500	3512238	66	205	170	4x18	109	102	30	105	35	34
80	KF 100-500	1190439-500	IR 100-500	1190409-500	3512239	81	220	185	6x18	120	110	30	114	40	32
100	KF 100-41	1190439-041	IR 100-10	1190409-010	1190045	98	228	195	8x18	144	130	30	135	45	32
125	KF 125-9	1190450-009	IR 125-6	1190410-006	1190026	120	250	215	8x18	175	165	35	170	50	38
150	KF 150-19	1190451-019	IR 150-10	1190411-010	1190047	143	305	260	8x22	205	200	40	204	50	45

Journal flange connection with O-ring

For high speeds we recommend to install the rotary joint without alignement of the quick release flange and to seal by means of an O-ring.

Attention:
Account for the medium and the temperature when selecting the O-ring.



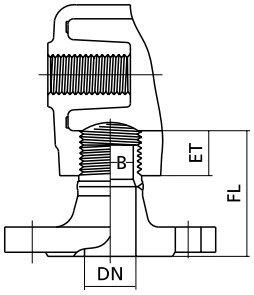
Flanges for Housing Connection

Sealing in Thread

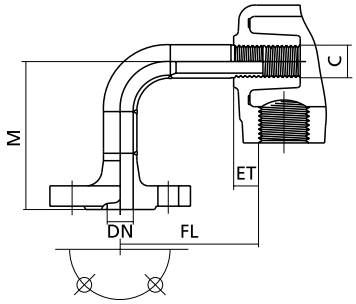
Flanges for housing connections are primarily used for systems with thermal oil. In the case of media other than water, we recommend using flanges for temperatures of more than 50°C (in accordance with DIN 4754).

The flanges consist of seamless pipes DIN 2448 with male thread ISO 228, welded to a welded neck DIN 2633/2635. Up to DN 80, the connection dimensions for PN 16 and PN 40 are identical. Sealing between flange and rotary joint housing by means of brazing if thermal oil is used. For other media, sealing tape is sufficient.

Some versions are factory-equipped with flanges or factory-designed for flanges. The flanges may also be ordered separately.



Flange with neck



Flange with elbow

Flanges with neck PN 16 DIN 2633 and PN 40 DIN 2635

DN	Type Designation	PN max.	Order No.	B	ET	FL	Order No. Flat packing
10	FS 10-14	PN 40	1190200-014	G 3/8 A	13	55	3512263
15	FS 15-15	PN 40	1190201-015	G 1/2 A	13	60	3512264
20	FS 20-5	PN 40	1190202-005	G 3/4 A	15	60	3512265
25	FS 25-23	PN 40	1190203-023	G 1 A	20	70	3512266
32	FS 32-22	PN 40	1190204-022	G 1 1/4 A	20	70	3512267
40	FS 40-6	PN 40	1190205-006	G 1 1/2 A	25	85	3512268
50	FS 50-19	PN 40	1190206-019	G 2 A	30	85	3512269
65	FS 65-17	PN 40	1190207-017	G 2 1/2 A	35	100	3512270
80	FS 80-9	PN 40	1190208-009	G 3A	35	105	3512271
100	FS 100-2	PN 16	1190209-002	G 4 A	40	115	3512272
100	FS 100-6	PN 40	1190209-006	G 4 A	40	115	3512272

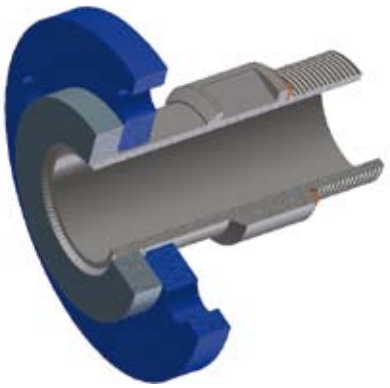
Flanges with elbow PN 40 DIN 2635

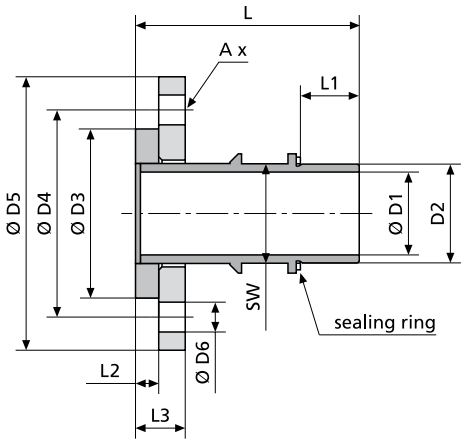
DN	Type Designation	Order No.	C	ET	M	FL	Order No. Flat packing
10	FB 10-10	1190300-010	G 3/8 A	13	96	90	3512263
15	FB 15-9	1190301-009	G 1/2 A	13	105	96	3512264
20	FB 20-14	1190302-014	G 3/4 A	15	115	110	3512265
25	FB 25-15	1190303-015	G 1 A	20	135	115	3512266
32	FB 32-18	1190304-018	G 1 1/4 A	20	140	120	3512267
40	FB 40-15	1190305-015	G 1 1/2 A	25	150	135	3512268
50	FB 50-31	1190306-031	G 2 A	30	205	140	3512269
65	FB 65-37	1190307-037	G 2 1/2 A	35	205	145	3512270
80	FB 80-12	1190308-012	G 3 A	35	205	160	3512271

Loose Flanges for Housing Connection

Sealing with sealing rings

The flanges consist of a threaded piece with male thread ISO 228, welded to a welded neck with loose flange DIN 2656 (PN 40). Sealing between flange and rotary joint housing at nominal diameter 15–40 by means of a copper sealing ring, from nominal diameter 50 sealing by means of a flat graphite packing to be ordered separately.





Dimension table for screw-in flanges rated pressure PN 40

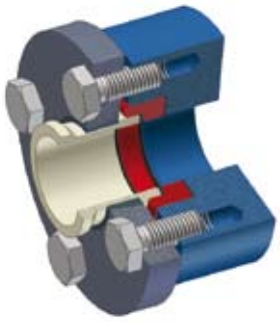
DN	L	L1	L2	L3	D1	D2	D3	D4	D5	A	D6	SW	Order No. screw-in flange	Order No. sealing ring	Order No. Flat packing
15	106	17,0	12	28	14	G 1/2 A	45	65	95	4	14	24	1190201-101	3502115-001	3512264
20	109,5	18,0	14	30	19	G 3/4 A	58	75	105	4	14	30	1190202-101	3502120-001	3512265
25	112	20,5	14	32	23,3	G 1 A	68	85	115	4	14	36	1190203-101	3502111-001	3512266
32	116	22,5	14	32	32	G 1 1/4 A	78	100	140	4	18	46	1190204-101	3502117-001	3512267
40	120	24,5	14	32	38,3	G 1 1/2 A	88	110	150	4	18	50	1190205-101	3502118-001	3512268
50	128	29,0	16	36	50	G 2 A	102	125	165	4	18	60	1190206-101	3502121-010	3512269
65	135	32,0	16	36	64	G 2 1/2 A	122	145	185	8	18	75	1190207-101	3502124-010	3512270
80	158	33,5	18	40	77	G 3 A	138	160	200	8	18	90	1190208-101	3502125-010	3512271
100	180	38	20	42	98	G 4 A	162	190	235	8	22	110	1190209-101	3502108-010	3512272

Maximum application data (pressure reduction factor at higher operating temperatures considered):
– water 28 bar and 230°C
– thermal oil 10 bar and 300°C

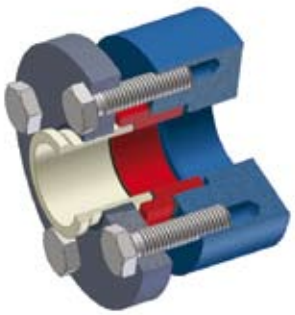
Please order a flat packing for the connection flange, if required. Sealing ring for nominal diameter 50–100 should be ordered in any case!

Material: steel, lacquered. Special stainless steel version available upon request.

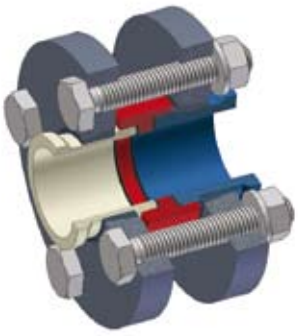
Custom-Made Parts for Rotary Joint Installation



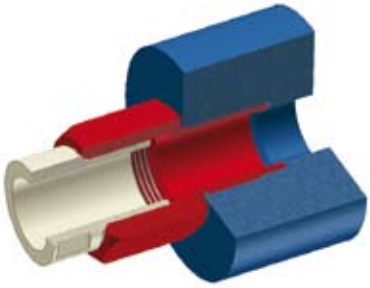
Intermediate ring ZR1



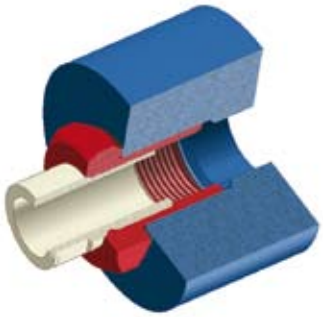
Intermediate ring ZR2



Intermediate ring ZR3



Intermediate ring ZR4



Intermediate ring ZR5



K flange and inner ring



Inner pipe version 1



Inner pipe version 2

Intermediate rings for K rotors

	Page
Intermediate ring ZR1	16
Intermediate ring ZR2	17
Intermediate ring ZR3	18

Intermediate rings for threaded rotors

Intermediate ring ZR4	19
Intermediate ring ZR5	20

Special K flanges and inner rings

	Page
K flange and inner ring	22

Inner pipes

Inner pipe version 1 fit – thread	24
Inner pipe version 2 fit – fit	24

Technical description
Intermediate rings for K rotors

Intermediate rings types ZR1 and ZR2 are required within installation of rotary joints with K flange in order to compensate for different centering diameters. By using intermediate rings, you can mount standard rotary joints with K flange connection without complex modifications of the roller.
Depending on the bolt circle, it may be necessary to use a special K flange and a special inner ring.

The type ZR3 intermediate ring can be used to mount rotary joints with K flange connection to roller journals in a relatively easy and cost-effective way. The K flange of the rotary joint in that case is screwed to a K flange at the journal of the roller.The design of the roller journal should be identical to that of the rotary joint with K flange connection. This allows you to use two standard K flanges and two standard inner rings. If this is impossible, you have to use special K flanges and inner rings in the installation. Flat packings are used to seal intermediate rings of types ZR1, ZR2 and ZR3.

Technical description
Intermediate rings for threaded rotors

Intermediate rings types ZR4 and ZR5 are required in the installation of rotary joints with threaded connections in order to compensate for different centering diameters. Sealing rings are used between the adapter piece and the roller. In the case of threaded rotors, a 60° cone is used for sealing purposes between the rotary joint and the adapter piece (with the exception of series DP).

At changing direction of rotation the threads must be secured. The ZR4 and ZR5 intermediate rings are available with G/BSP (ISO 228) and NPT (ANSI) threads.

Intermediate rings should not be used in applications at greater speeds.

Ordering/Inquiry Instructions

For custom-made intermediate rings, special K flanges, special inner rings and inner pipes

1. Copy the catalog pages with the required special parts for your installation as well as the order/inquiry sheet for installation accessories.

2. Specify the required dimensions in table 2 and table 3. Please note the appropriate remarks. The carbon graphite flat packing for sealing is automatically delivered with the intermediate rings (ZR1, ZR2 and ZR3) if you fill in table 3.

3. In the table on the ordering sheet for installation accessories, specify the following information
   - Item
   - Designation (ZR1, ZR2, ZR3, ZR4, ZR5, inner pipe version 1, inner pipe version 2 or K flange with inner ring)
   - Material (if you do not specify a material, we will use the standard material mentioned)
   - Quantity
   - Wanted date of delivery

4. After you have filled in the table, please specify whether you want to order or just inquire (please tick).

5. Finally, we need your company information. Please fax the sheets to +49 7321 317-139.

You can also download the catalog sheets at www.maier-heidenheim.de.

Installation Accessories – Order or Inquiry

Please fill in copy and fax to +49 7321 317-139.

Christian Maier GmbH & Co. KG
Würzburger Straße 67 – 69
89520 Heidenheim, Germany

Tel. +49 7321 317-0
Fax +49 7321 317-139
vkd@maier-heidenheim.de
www.maier-heidenheim.de

☐ **Order** ☐ **Inquiry**

Company

Customer number (if applicable) Purchase Order No.

Contact Phone/Fax E-mail

Address

Product

Item	Designation	Material	Quantity	Wanted Del. Date

Date, signature

Intermediate Ring ZR1

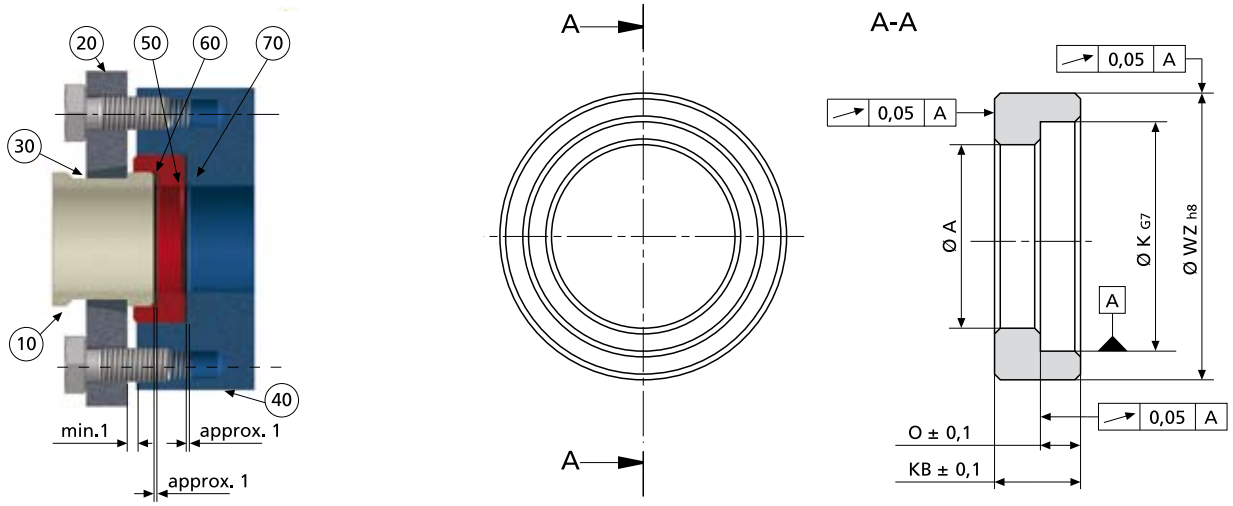


Table 1

Item	Designation
10	Rotary joint*1
20	K flange*1
30	Inner ring*1
40	Roller connection
50	Intermediate ring ZR1*3
60	Flat packing between rotary joint and intermediate ring*1
70	Flat packing between intermediate ring and roller connection*4

Table 2

Dimension	Dimension table intermediate ring ZR1 item 50*3	
Ø A		mm
Ø K		mm
Ø WZ*2		mm
O		mm
KB		mm

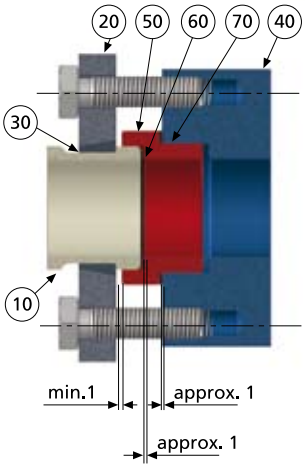
Table 3

Dimension	Dimension table flat packing item 70*4	
Ø A		mm
Ø WZ*2		mm

*1 See pages 8 and 9 for dimensions
*2 Max. diameter 100 mm
*3 See table 2
*4 See table 3

Standard material stainless steel 1.4301. Special materials upon request. The installation of an intermediate ring changes the length of the inner pipe. Please note the dimension and shape tolerances. The ordering party is responsible for the technical design. Please keep this ordering document since you will need this information for re-orders.

Intermediate Ring ZR2



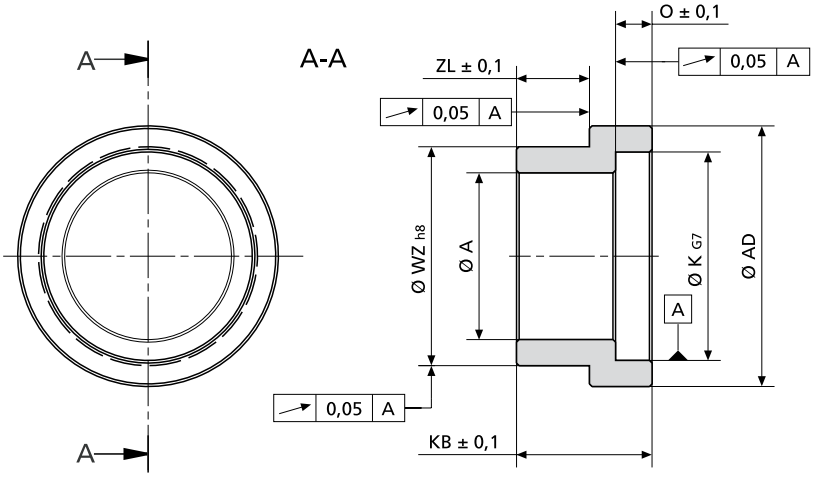


Table 1

Item	Designation
10	Rotary joint[*1]
20	K flange[*1]
30	Inner ring[*1]
40	Roller connection
50	Intermediate ring ZR2[*3]
60	Flat packing between rotary joint and intermediate ring[*1]
70	Flat packing between intermediate ring and roller connection[*4]

Table 2

Dimension	Dimension table intermediate ring ZR2 item 50[*3]	
Ø A		mm
Ø AD		mm
Ø K		mm
Ø WZ[*2]		mm
O		mm
KB		mm
ZL		mm

Table 3

Dimension	Dimension table flat packing item 70[*4]	
Ø AD		mm
Ø WZ[*2]		mm

[*1] See pages 8 and 9 for dimensions
[*2] Max. diameter 100 mm
[*3] See table 2
[*4] See table 3

Standard material stainless steel 1.4301. Special materials upon request. The installation of an intermediate ring changes the length of the inner pipe. Please note the dimension and shape tolerances. The ordering party is responsible for the technical design. Please keep this ordering document since you will need this information for re-orders.

Intermediate Ring ZR3

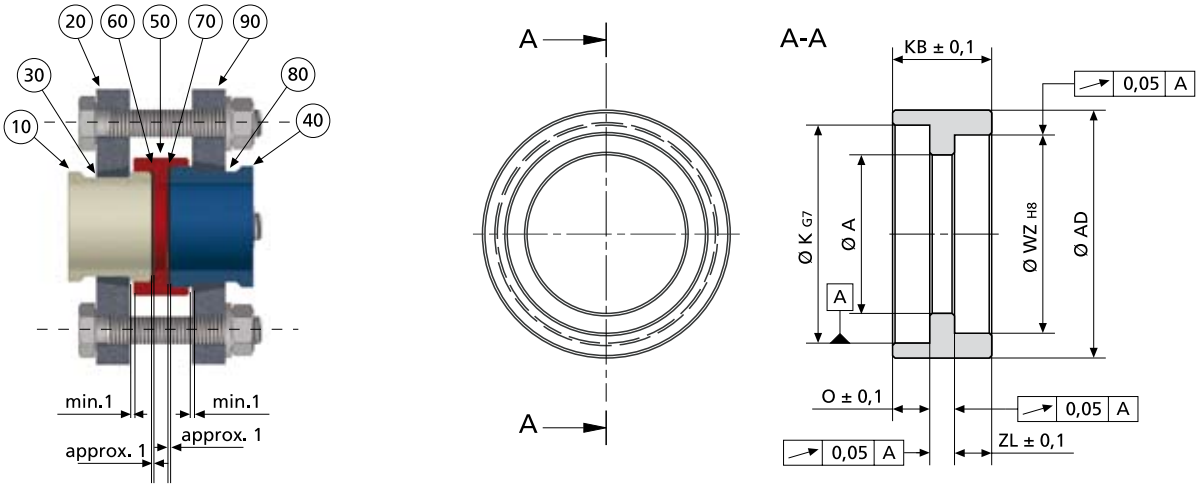


Table 1

Item	Designation
10	Rotary joint rotor connection[*1]
20	K flange[*1]
30	Inner ring[*1]
40	Roller connection
50	Intermediate ring ZR3[*3]
60	Flat packing between rotary joint and intermediate ring[*1]
70	Flat packing between intermediate ring and roller connection[*4]
80	Standard or special inner ring
90	Standard or special K flange

[*1] See pages 8 and 9 for dimensions
[*2] Max. diameter 100 mm
[*3] See table 2
[*4] See table 3

Standard material stainless steel 1.4301. Special materials upon request. The installation of an intermediate ring changes the length of the inner pipe. Please note the dimension and shape tolerances. The ordering party is responsible for the technical design. Please keep this ordering document since you will need this information for re-orders.

Table 2

Dimension	Dimension table intermediate ring ZR3 item 50[*3]
Ø A	mm
Ø AD	mm
Ø K	mm
Ø WZ[*2]	mm
O	mm
ZL	mm
KB	mm

Table 3

Dimension	Dimension table flat packing item 70[*4]
Ø A	mm
Ø WZ[*2]	mm

Intermediate Ring ZR4

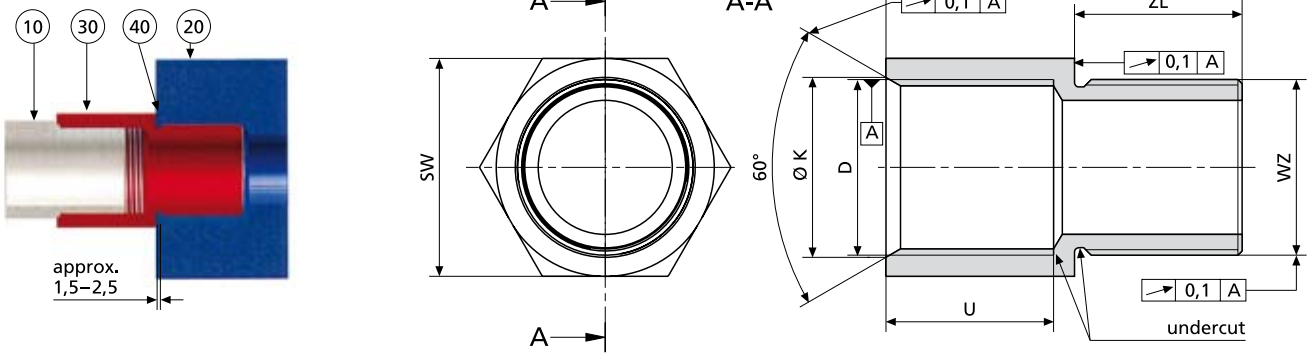


Table 1

Item	Designation
10	Rotary joint rotor connection[*1]
20	Roller connection
30	Intermediate ring ZR4[*3]
40	Sealing ring

[*1] See pages 8 and 9 for dimensions
[*2] Max. spanner 100 mm for SW 65 and greater with 2 cut surfaces
[*3] See table 3
[*4] Please specify the outside diameter of the thread in mm when ordering. Please check the frame width of the sealing ring before ordering.
[*5] Please specify the direction of the thread pitch when ordering.

Preferred series: SW 19, 24, 30, 36, 46, 55, 60.
Standard material stainless steel.
Special material upon request.
The installation of an intermediate ring changes the length of the inner pipe.
Please note the dimension and shape tolerances.
The ordering party is responsible for the technical design.
Re-ordering is only possible with this ordering sheet.

Sealing rings for WZ on page 11, CU sealing rings, otherwise special sealing ring made of graphite.

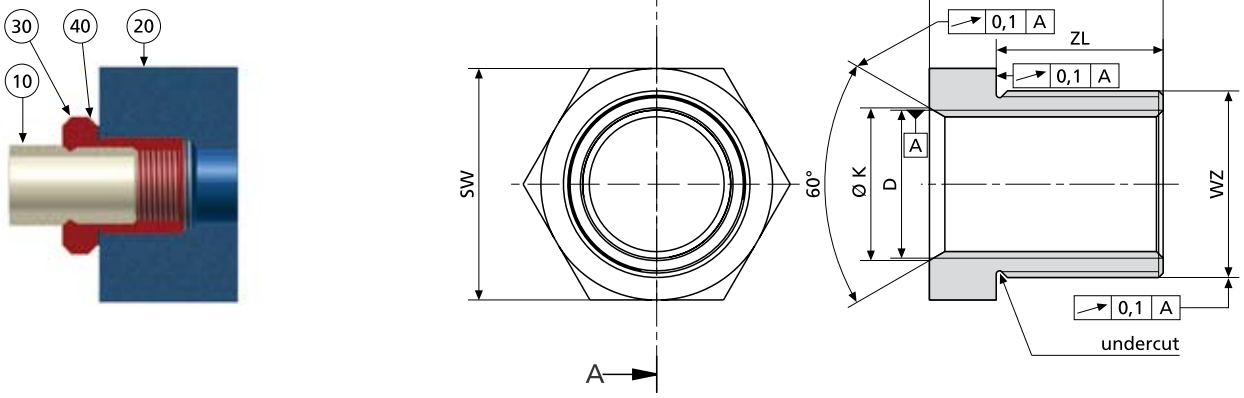
Table 2

Dimension	Dimension table sealing ring item 40
WZ[*4]	☐ mm
SW[*4]	☐ mm

Table 3

Dimension	Dimension table intermediate ring ZR4 item 30
SW[*2]	☐ mm
D[*5]	☐ R/BSP DIN (ISO 7) ☐ right ☐ G/BSP DIN (ISO 228) ☐ left ☐ NPT (ANSI)
WZ[*5]	☐ R/BSP DIN (ISO 7) ☐ right ☐ G/BSP DIN (ISO 228) ☐ left ☐ NPT (ANSI)
KB	☐ mm
ZL	☐ mm
U	☐ mm
Ø K	☐ mm

Intermediate Ring ZR5



Sealing rings for WZ on page 11, CU sealing rings, otherwise special sealing ring made of graphite.

Table 1

Item	Designation
10	Rotary joint rotor connection[*1]
20	Roller connection
30	Intermediate ring ZR5[*3]
40	Sealing ring

Table 2

Dimension	Dimension table sealing ring item 40
WZ[*4]	☐ mm
SW[*4]	☐ mm

Table 3

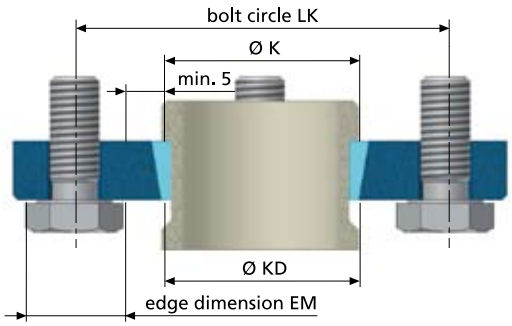
Dimension	Dimension table intermediate ring ZR5 item 30
SW[*2]	☐ mm
D[*5]	☐ R/BSP DIN (ISO 7) ☐ right ☐ G/BSP DIN (ISO 228) ☐ left ☐ NPT (ANSI)
WZ[*5]	☐ R/BSP DIN (ISO 7) ☐ right ☐ G/BSP DIN (ISO 228) ☐ left ☐ NPT (ANSI)
KB	☐ mm
ZL	☐ mm
Ø K	☐ mm

[*1] See pages 8 and 9 for dimensions
[*2] Max. spanner 100 mm
[*3] See table 3
[*4] Please specify the outside diameter of the thread in mm when ordering. Please check the frame width of the sealing ring before ordering.
[*5] Please specify the direction of the thread pitch when ordering.

Preferred series: SW 19, 24, 30, 36, 46, 55, 60.
Standard material stainless steel.
Special material upon request.
The installation of an intermediate ring changes the length of the inner pipe.
Please note the dimension and shape tolerances.
The ordering party is responsible for the technical design.
Re-ordering is only possible with this ordering sheet.

Instructions for Specifying the Dimensions of custom-made K Flanges and Inner Rings

The installation of rotary joints with K rotor and intermediate rings may require K flanges and inner rings with special dimensions. The next page assists you to order special K flanges and inner rings according to your specifications.



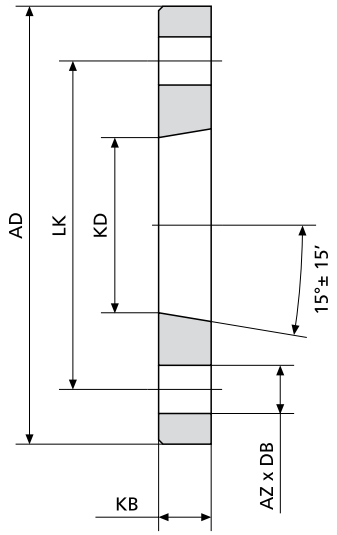
- Specify the width (dimension KB) of the K flange according to the selection table on page 8 (standard K flange). You must select in accordance with the nominal diameter and the series of the rotary joint to be connected.
- Specify the hole values (AZ x Ø DB) of the K flange according to the selection table on page 8 (standard K flange). You must select in accordance with the nominal diameter and the series of the rotary joint to be connected.
- Always order the K flange and the inner ring together. Use the standard inner ring, if possible.
- Observe the bolt circle when dimensioning the K flange and the inner ring. If the bolt circle is too small, the screws cannot be mounted.

  Formula: LK – EM > K + 5
  Bolt circle – edge dimension of the fastening screw must be greater than the rotor diameter dimension K + 5 mm.

- Dimension KD must be greater than dimension K. This assures that the K flange can be pushed over the rotor of the rotary joint.

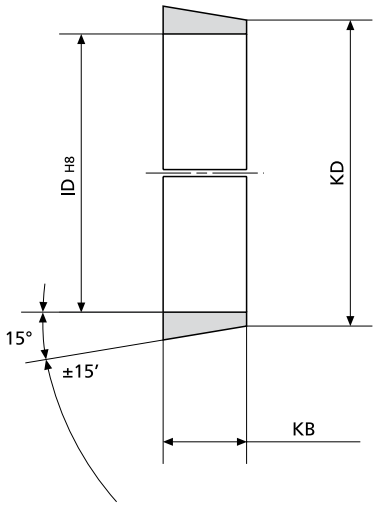
Special K flange

Dimension	Dimension table K flange
AD	mm
LK	mm
KD	mm
AZ	
DB	mm
KB	mm



Special inner ring

Dimension	Dimension table inner ring
ID*1	mm
KD	mm
KB	mm



Please always order the K flange and the inner ring together. Standard material steel.
Special material upon request. Please note the information on pages 8 and 9 when choosing the K flange and inner ring dimensions. The ordering party is responsible for the technical design. Re-ordering is only possible with this ordering sheet.

Custom-Made Inner Pipes for Rotary Joints

For fixed and rotating inner pipes



The following page assists you to order inner pipes for rotary joints. Please fill in the required dimensions. The dimensions of the inner pipes are adapted to our rotary joints. The table to the right shows the standard dimensions of the inner pipes as well as the threads for stationary inner pipes and the fits for rotating inner pipes.

Dimensions: outside diameter D1 x wall t	Thread G	Fit D2, D3
10,2 x 2	1/8	10e8
13,5 x 2,3	1/4	12e8
17,2 x 2,3	3/8	16e8
21,3 x 2,6	1/2	20e8
26,9 x 2,6	3/4	25e8
33,7 x 3,2	1	31,8e8
42,4 x 3,2	1 1/4	40e8
48,3 x 3,2	1 1/2	45e8
60,3 x 3,6	2	60e8
76,1 x 3,6	2 1/2	75e8
88,9 x 4	3	88e8

Please contact us for technical design assistance. Note that excessively long inner pipes without additional support may damage the bearing of the rotary joints. The table to the right lists the maximum inner pipe length that should not be exceeded under normal circumstances. The dimensions shown in the above table serve as the basis for the maximum length of the inner pipes.

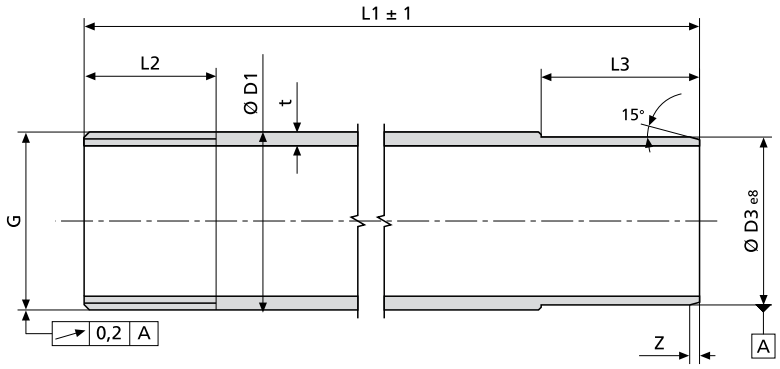
Nominal diameter thread G	Maximum inner pipe length L1
1/8, 1/4, 3/8	1000 mm
1/2, 3/4, 1	1250 mm
1 1/4, 1 1/2	1600 mm
2, 2 1/2, 3	2000 mm

Please note that the maximum dimensions are approximate value. Depending on the application (speed, pressure and temperature), these values may need to be adjusted.

Please consider the axial heat expansion of the inner pipe. There must be clearance between the inner pipe and the connection (rotary joint or roller). The ordering party is responsible for the technical design.

Inner pipe version 1 thread – fit ☐ (please check)

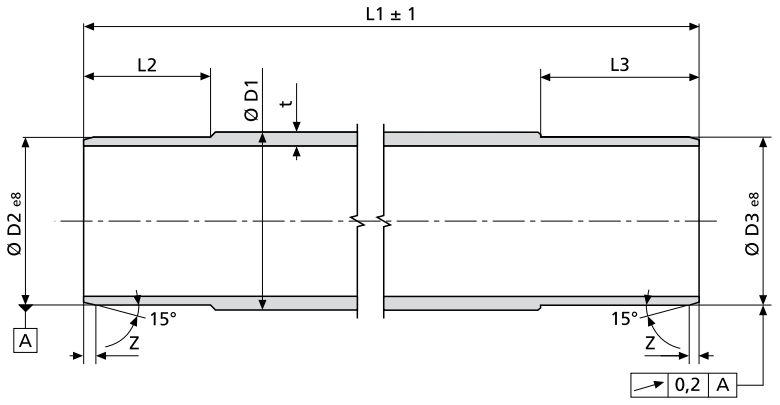
Dimension	Dimension table inner pipe version 1
Ø D1	☐ mm
Ø D3	☐ mm
G	☐ R/BSP DIN (ISO 7) ☐ G/BSP DIN (ISO 228) ☐ NPT (ANSI)
L1	☐ mm
L2	☐ mm
L3	☐ mm
t	☐ mm
z	☐ mm



Standard material 1.4301☐ plain steel☐
(please check)

Inner pipe version 2 fit – fit ☐ (please check)

Dimension	Dimension table inner pipe version 2
Ø D1	☐ mm
Ø D2	☐ mm
Ø D3	☐ mm
L1	☐ mm
L2	☐ mm
L3	☐ mm
t	☐ mm
z	☐ mm



The ordering party is responsible for the technical design.

Standard material 1.4301☐ plain steel☐
(please check)

Threaded Fittings

Versions:
Reducing piece R, Adapter A, Expansion E



Variant
- A
- B
- D
- E
- F
- H

Size a
male thread

Type designation example: R - A - 1- i - 1 1/2 - a

Size i
female thread

Versions
- Reducing piece
- Adapter
- Expansion

Thread and material variants

Variant	Thread rotary joint	Thread medium	Material
A	BSP DIN ISO 228	BSP DIN ISO 228	Galvanized steel
B	BSP DIN ISO 228	NPT ANSI/ASME B1.1-1983	Galvanized steel
D	NPT ANSI/ASME B1.1-1983	NPT ANSI/ASME B1.1-1983	Galvanized steel
E	BSP DIN ISO 228	BSP DIN ISO 228	1.4571
F	BSP DIN ISO 228	NPT ANSI/ASME B1.1-1983	1.4571
H	NPT ANSI/ASME B1.1-1983	NPT ANSI/ASME B1.1-1983	1.4571

The fittings have a cutting ring for sealing, i.e. you do not require an additional sealing element. Screwing in the fittings several times may result in leaks.

Tightening torque for threaded fittings with sealing edge

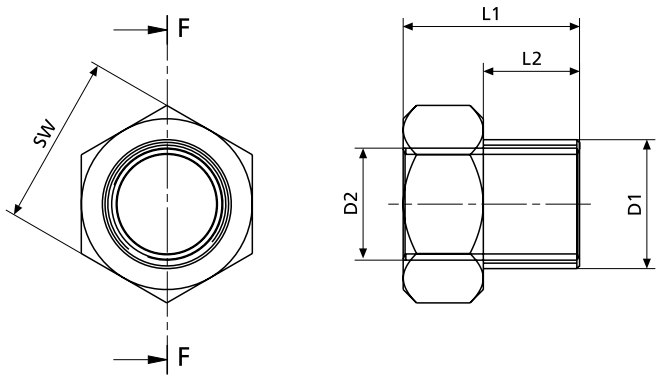
Thread	DN	Counter material		
		Brass	Steel/cast	
1/8	6	14,4	18	Nm
1/4	8	28	35	Nm
3/8	10	56	70	Nm
1/2	15	112	140	Nm
3/4	20	144	180	Nm
1	25	264	330	Nm
1 1/4	32	432	540	Nm
1 1/2	40	504	630	Nm
2	50	640	800	Nm

Tolerance of the torques specified in the table: ± 10%.
Note: Apply oil to the threaded fittings before mounting them!

Please note when mounting!
Only screw the threaded fitting into the housing when the housing is restrained. Otherwise bearing and seal damage may occure.

Fitting R

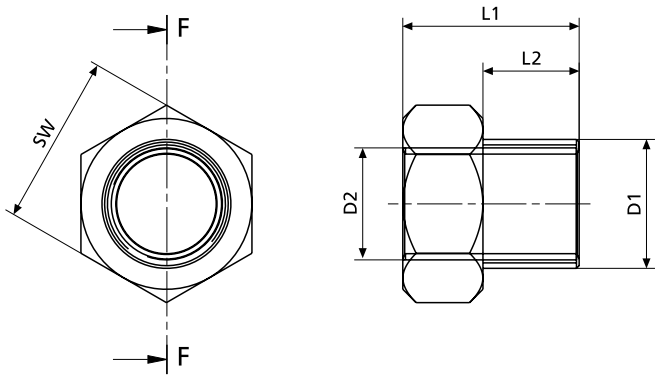
from BSP DIN ISO 228 male thread
to BSP DIN ISO 228 female thread



Designation	Order No.	D1	D2	L1	L2	SW	Material
R-A-1/8-i-1/4-a	3513580-001	G 1/4	G 1/8	28	12	19	Galvanized steel
R-A-1/4-i-3/8-a	3513580-002	G 3/8	G 1/4	36	12	22	Galvanized steel
R-A-1/4-i-1/2-a	3513580-003	G 1/2	G 1/4	24	14	27	Galvanized steel
R-A-3/8-i-1/2-a	3513580-004	G 1/2	G 3/8	36	14	27	Galvanized steel
R-A-1/2-i-3/4-a	3513580-005	G 3/4	G 1/2	41	16	32	Galvanized steel
R-A-1/2-i-1-a	3513580-006	G 1	G 1/2	29	18	41	Galvanized steel
R-A-3/4-i-1-a	3513580-007	G 1	G 3/4	47	18	41	Galvanized steel
R-A-3/4-i-11/4-a	3513580-008	G 1 1/4	G 3/4	32	20	60	Galvanized steel
R-A-1-i-11/4-a	3513580-009	G 1 1/4	G 1	52	20	60	Galvanized steel
R-A-1-i-11/2-a	3513580-010	G 1 1/2	G 1	36	22	55	Galvanized steel
R-A-11/4-i-11/2-a	3513580-011	G 1 1/2	G 1 1/4	58	22	55	Galvanized steel
R-A-11/2-i-2-a	3513580-012	G 2	G 1 1/2	62	24	70	Galvanized steel
R-E-1/8-i-1/4-a	3513581-001	G 1/4	G 1/8	28	12	19	1.4571
R-E-1/4-i-3/8-a	3513581-002	G 3/8	G 1/4	36	12	22	1.4571
R-E-1/4-i-1/2-a	3513581-003	G 1/2	G 1/4	24	14	27	1.4571
R-E-3/8-i-1/2-a	3513581-004	G 1/2	G 3/8	36	14	27	1.4571
R-E-1/2-i-3/4-a	3513581-005	G 3/4	G 1/2	41	16	32	1.4571
R-E-1/2-i-1-a	3513581-006	G 1	G 1/2	29	18	41	1.4571
R-E-3/4-i-1-a	3513581-007	G 1	G 3/4	47	18	41	1.4571
R-E-3/4-i-11/4a	3513581-008	G 1 1/4	G 3/4	32	20	60	1.4571
R-E-1-i-11/4-a	3513581-009	G 1 1/4	G 1	52	20	60	1.4571
R-E-1-i-11/2-a	3513581-010	G 1 1/2	G 1	36	22	55	1.4571
R-E-11/4-i-11/2-a	3513581-011	G 1 1/2	G 1 1/4	58	22	55	1.4571
R-E-11/2-i-2-a	3513581-012	G 2	G 1 1/2	62	24	70	1.4571

Fitting R

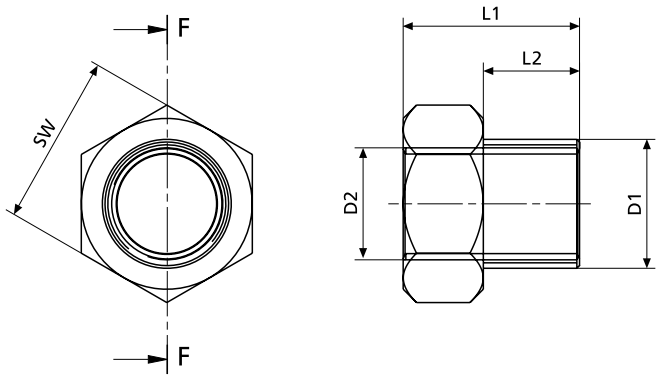
from BSP DIN ISO 228 male thread
to NPT ANSI/ASME B1.20.1-1983 female thread



Designation	Order No.	D1	D2	L1	L2	SW	Material
R-B-1/8-i-1/4-a	3513582-001	G 1/4	NPT 1/8	28	14	19	Galvanized steel
R-B-1/4-i-3/8-a	3513582-002	G 3/8	NPT 1/4	36	14	22	Galvanized steel
R-B-1/4-i-1/2-a	3513582-003	G 1/2	NPT 1/4	24	15	27	Galvanized steel
R-B-3/8-i-1/2-a	3513582-004	G 1/2	NPT 3/8	36	15	27	Galvanized steel
R-B-1/2-i-3/4-a	3513582-005	G 3/4	NPT 1/2	41	18	32	Galvanized steel
R-B-1/2-i-1-a	3513582-006	G 1	NPT 1/2	29	18	41	Galvanized steel
R-B-3/4-i-1-a	3513582-007	G 1	NPT 3/4	47	19	41	Galvanized steel
R-B-3/4-i-11/4-a	3513582-008	G 1 1/4	NPT 3/4	32	19	55	Galvanized steel
R-B-1-i-11/4-a	3513582-009	G 1 1/4	NPT 1	52	27	55	Galvanized steel
R-B-1-i-11/2-a	3513582-010	G 1 1/2	NPT 1	36	27	60	Galvanized steel
R-B-11/4-i-11/2-a	3513582-011	G 1 1/2	NPT 1 1/4	58	27,5	60	Galvanized steel
R-B-11/2-i-2-a	3513582-012	G 2	NPT 1 1/2	62	27,5	70	Galvanized steel

Fitting R

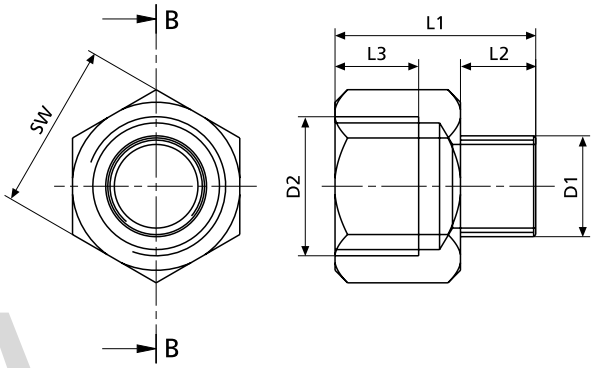
from NPT ANSI/ASME B1.20.1-1983 male thread
to NPT ANSI/ASME B1.20.1-1983 female thread



Designation	Order No.	D1	D2	L1	L2	SW	Material
R-D-1/8-i-1/4-a	3513583-001	NPT 1/4	NPT 1/8	21	14	16	Galvanized steel
R-D-1/4-i-3/8-a	3513583-002	NPT 3/8	NPT 1/4	21	14	19	Galvanized steel
R-D-1/4-i-1/2-a	3513583-003	NPT 1/2	NPT 1/4	20	15	22	Galvanized steel
R-D-3/8-i-1/2-a	3513583-004	NPT 1/2	NPT 3/8	20	15	22	Galvanized steel
R-D-1/2-i-3/4-a	3513583-005	NPT 3/4	NPT 1/2	24	18	27	Galvanized steel
R-D-1/2-i-1-a	3513583-006	NPT 1	NPT 1/2	26	19	33	Galvanized steel
R-D-3/4-i-1-a	3513583-007	NPT 1	NPT 3/4	26	19	33	Galvanized steel
R-D-3/4-i-11/4-a	3513583-008	NPT 1 1/4	NPT 3/4	38,5	26	46	Galvanized steel
R-D-1-i-11/4-a	3513583-009	NPT 1 1/4	NPT 1	41	26,5	46	Galvanized steel
R-D-1-i-11/2-a	3513583-010	NPT 1 1/2	NPT 1	41,5	27	50	Galvanized steel
R-D-11/4-i-11/2-a	3513583-011	NPT 1 1/2	NPT 1 1/4	41	27,5	50	Galvanized steel
R-D-11/2-i-2-a	3513583-012	NPT 2	NPT 1 1/2	45	27,5	65	Galvanized steel
R-H-1/8-i-1/4-a	3513584-001	NPT 1/4	NPT 1/8	21	14	16	1.4571
R-H-1/4-i-3/8-a	3513584-002	NPT 3/8	NPT 1/4	21	14	19	1.4571
R-H-1/4-i-1/2-a	3513584-003	NPT 1/2	NPT 1/4	20	15	22	1.4571
R-H-3/8-i-1/2-a	3513584-004	NPT 1/2	NPT 3/8	20	15	22	1.4571
R-H-1/2-i-3/4-a	3513584-005	NPT 3/4	NPT 1/2	24	18	27	1.4571
R-H-1/2-i-1-a	3513584-006	NPT 1	NPT 1/2	26	19	33	1.4571
R-H-3/4-i-1-a	3513584-007	NPT 1	NPT 3/4	26	19	33	1.4571
R-H-3/4-i-11/4-a	3513584-008	NPT 1 1/4	NPT 3/4	38,5	26	46	1.4571
R-H-1-i-11/4-a	3513584-009	NPT 1 1/4	NPT 1	41	26,5	46	1.4571
R-H-1-i-11/2-a	3513584-010	NPT 1 1/2	NPT 1	41,5	27	50	1.4571
R-H-11/4-i-11/2-a	3513584-011	NPT 1 1/2	NPT 1 1/4	41	27,5	50	1.4571
R-H-11/2-i-2-a	3513584-012	NPT 2	NPT 1 1/2	45	27,5	65	1.4571

Fitting A

from BSP DIN ISO 228 male thread
to NPT ANSI/ASME B1.20.1-1983 female thread

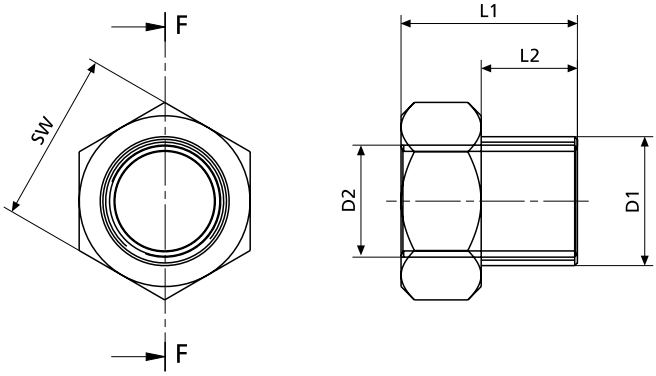


A

Designation	Order No.	D1	D2	L1	L2	L3	SW	Material
A-B-1/8-i-1/8-a	3513585-001	G 1/8	NPT 1/8	23	9	10,5	16	Galvanized steel
A-B-1/4-i-1/4-a	3513585-002	G 1/4	NPT 1/4	31	12	13	19	Galvanized steel
A-B-3/8-i-3/8-a	3513585-003	G 3/8	NPT 3/8	34	13	14	24	Galvanized steel
A-B-1/2-i-1/2-a	3513585-004	G 1/2	NPT 1/2	40	15	17,5	29	Galvanized steel
A-B-3/4-i-3/4-a	3513585-005	G 3/4	NPT 3/4	42	17	18	36	Galvanized steel
A-B-1-i-1-a	3513585-006	G 1	NPT 1	49,5	18,5	23	50	Galvanized steel
A-B-11/4-i-11/4-a	3513585-007	G.1 1/4	NPT 1 1/4	54	20,5	23,5	54	Galvanized steel
A-B-11/2-i-11/2-a	3513585-008	G 1 1/2	NPT 1 1/2	56	22,8	21,5	65	Galvanized steel
A-F-1/8-i-1/8-a	3513586-001	G 1/8	NPT 1/8	23	9	10,5	16	1.4571
A-F-1/4-i-1/4-a	3513586-002	G 1/4	NPT 1/4	31	12	13	19	1.4571
A-F-3/8-i-3/8-a	3513586-003	G 3/8	NPT 3/8	34	13	14	24	1.4571
A-F-1/2-i-1/2-a	3513586-004	G 1/2	NPT 1/2	40	15	17,5	29	1.4571
A-F-3/4-i-3/4-a	3513586-005	G 3/4	NPT 3/4	42	17	18	36	1.4571
A-F-1-i-1-a	3513586-006	G 1	NPT 1	49,5	18,5	23	50	1.4571
A-F-11/4-i-11/4-a	3513586-007	G 1 1/4	NPT 1 1/4	54	20,5	23,5	54	1.4571
A-F-11/2-i-11/2-a	3513586-008	G 1 1/2	NPT 1 1/2	56	22,8	21,5	65	1.4571
A-F-2-i-2-a	3513586-009	G2	NPT 2	62	24	28	70	1.4571

Fitting E

from BSP DIN ISO 228 male thread
to BSP DIN ISO 228 female thread



E

Designation	Order No.	D1	D2	L1	L2	L3	SW	Material
E-A-1/4-i-1/8-a	3513587-001	G 1/8	G 1/4	31	8	17	19	Galvanized steel
E-A-3/8-i-1/4-a	3513587-002	G 1/4	G 3/8	36	12	17	24	Galvanized steel
E-A-1/2-i-3/8-a	3513587-003	G 3/8	G 1/2	41	12	20	27	Galvanized steel
E-A-3/4-i-1/2-a	3513587-004	G 1/2	G 3/4	46	14	22	36	Galvanized steel
E-A-1-i-3/4-a	3513587-005	G 3/4	G 1	51	16	24,5	41	Galvanized steel
E-A-11/4-i-1-a	3513587-006	G 1	G 1 1/4	57	18	26,5	55	Galvanized steel
E-A-11/2-i-11/4-a	3513587-007	G 1 1/4	G 1 1/2	60	20	28,5	60	Galvanized steel
E-E-1/4-i-1/8-a	3513588-001	G 1/8	G 1/4	31	8	17	19	1.4571
E-E-3/8-i-1/4-a	3513588-002	G 1/4	G 3/8	36	12	17	24	1.4571
E-E-1/2-i-3/8-a	3513588-003	G 3/8	G 1/2	41	12	20	27	1.4571
E-E-3/4-i-1/2-a	3513588-004	G 1/2	G 3/4	46	14	22	36	1.4571
E-E-1-i-3/4-a-E	3513588-005	G 3/4	G 1	51	16	24,5	41	1.4571
E-E-11/4-i-1-a	3513588-006	G 1	G 1 1/4	57	18	26,5	55	1.4571
E-E-11/2-i-11/4-a	3513588-007	G 1 1/4	G 1 1/2	60	20	28,5	60	1.4571
E-E-2-i-11/2-a	3513588-008	G 1 1/2	G 2	62	24	28,5	70	1.4571

Metal Hoses



Flexible tube connections such as stainless steel hoses are essential pipe technology elements.

Metal hoses are universal connection elements that can be used for many chemicals, steam, water, oil, gas or vacuum. They compensate for expansion, stroke, vibration and mounting inaccuracies.

The service life of metal hoses depends on a variety of factors such as:

– operating pressure
– temperature
– amount of motion
– pressure shocks
– installation conditions
– motion frequency

Pressure graduation

Rated pressure 16
Metal hoses for series DP, DX und DQ.
Application data:
Water: 10 bar and 160°C
Thermal oil[*1]: 8 bar and 300°C
Connection flanges and screw connection as per rated pressure PN 16[*2].

Rated pressure 20
Metal hoses for series H, M, DCL und DA.
Application data:
Water/steam: 20 bar and 200°C
Thermal oil[*1]: 10 bar and 320°C
Connection flanges and screw connection as per rated pressure PN 40[*2].

Rated pressure 30
Metal hoses for series HWB, DCB und DA.
Application data:
Water/steam: 28 bar and 230°C
Thermal oil[*1]: 10 bar and 320°C
Connection flanges and screw connection as per rated pressure PN 40[*2].

Rated pressure 40
Metal hoses for series HWA and special series HW.
Application data:
Water/steam: 40 bar and 250°C
Thermal oil[*1]: 10 bar and 320°C
Dimensioning upon request. Connection parts must be rated pressure PN 64[*2].
Specifications upon request.

[*1] Thermal oil graduation according to Pressure Equipment Directive 97/23/CE
"boiling pressure liquid pd ➔ 0.5 bar"
[*2] Please note the pressure reduction factors due to the connection parts. Stainless steel connection parts may increase the rated pressure.

Pressure reduction factors at higher operating temperatures

Temperature °C	20°C	100°C	150°C	200°C	250°C	300°C	350°C
1.4571	1	0,8	0,76	0,72	0,66	0,64	0,62
Plain steel	1	0,9	0,89	0,86	0,82	0,76	0,73
1.4301	1	0,73	0,66	0,6	0,55	0,51	0,49
1.4541	1	0,83	0,78	0,74	0,70	0,66	0,64

Installation notes

In order to obtain a long service life of the metal hoses, you need to consider a variety of important factors for the arrangement and installation of the hoses:

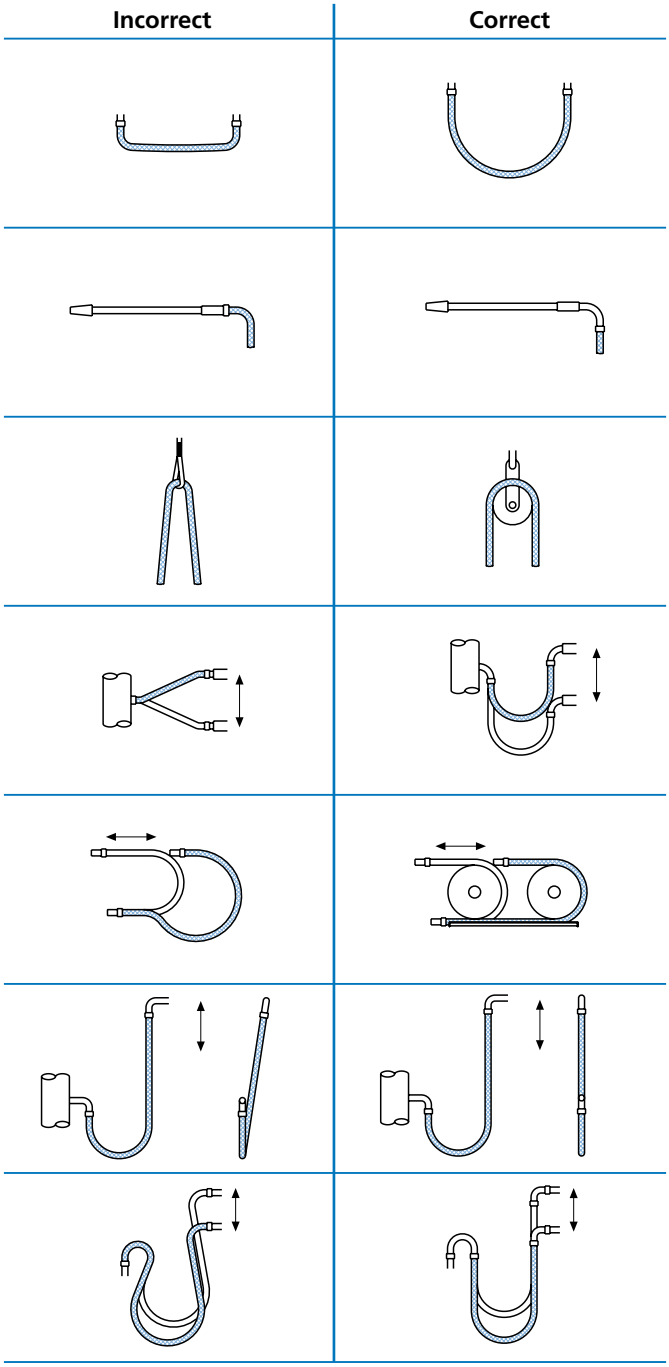
External loads
Avoid destruction of the structure due to abrasion or wall thickness reduction of non-braided hoses caused by rubbing on edges, surface or the floor.
An outside helix may be used as wear protection.

Specification of the nominal length
Always base your selection on the minimum bending radius specified in the tables, include sufficiently long neutral ends in order to avoid overbending the hose and prevent excessive loads on the transition areas from the hose to the fitting.

Minimum bending radius
The minimum bending radius is shown in the tables; do not use a smaller radius. You can prolong the service life of a metal hose by using a greater radius.

Arrangement and mounting without tension
The bent metal hose and the direction of movement always have to be in the same plane, otherwise, the hose will be subjected to destructive torsion. This also applies to mounting: always secure the screw connection when tightening it. In the case of flange connections, move it a number of times to assure tension-free alignment. The essential factors determining the theoretical service life were analyzed under laboratory conditions. However, under specific application conditions, the actual service life may be different, so include a sufficient safety factor depending on the load and the failure risk.

Nominal pressure
The requirements of the Pressure Equipment Directive 97/23/CE are met. 4x break-resistance of the braiding as per ISO 10380.

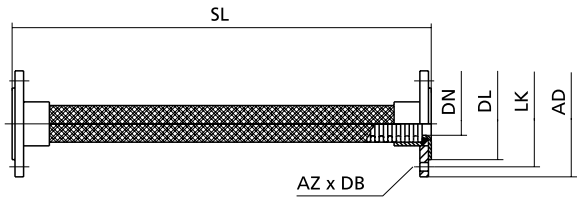


As opposed to rigid pipes, flexible hoses are wearing parts. If a hose defect poses the risk of injuries, take appropriate safety precautions.

Permissible length tolerances

Nominal length in mm	Permissible length tolerance
> 500	+7/–3 mm
501 <	+3%/–1% (ISO 10380)

Straight metal hose



You may combine different connection pieces. However, one connection must be a loose connection. In addition, the nominal diameter of the connection pieces may be one nominal diameter greater or smaller than that of the metal hose.

The ordering party is responsible for the technical design.

Design and nominal diameter connection 2

Rated pressure

Example: 50 - 20 - C40 - A50 - 0800

Nominal length SL

Nominal diameter metal hose

Design and nominal diameter connection 1

Angular hose

Nominal length SL1

Nominal length SL2

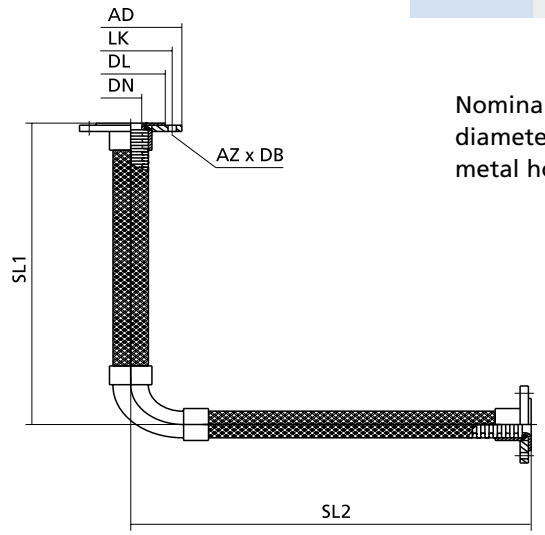
Rated pressure

Example: 50 - 16 - C50 - 0800 - A40 - 0900

Design and nominal diameter connection 2

Nominal diameter metal hose

Design and nominal diameter connection 1



Bending radii and weights

Rated pressures 16, 20 and 30
Flexible corrugated hoses, narrow corrugation, made of welded pipe, stainless steel braiding.

Materials:
1.4541 / AISI 321
1.4301 / AISI 304
1.4404 / AISI 316L
1.4571 / AISI 316Ti

DN		Rated pressure	Min. bending radius	Weight
mm	Inch	bar	mm	g/m
10	3/8	16	80	205
10	3/8	20	80	205
10	3/8	30	130	280
15	1/2	16	90	235
15	1/2	20	180	360
15	1/2	30	180	360
20	3/4	16	120	395
20	3/4	20	200	540
20	3/4	30	200	540
25	1	16	130	625
25	1	20	220	800
25	1	30	220	800
32	1 1/4	16	160	905
32	1 1/4	20	250	1000
32	1 1/4	30	250	1000
40	1 1/2	16	170	1120
40	1 1/2	20	270	1250
40	1 1/2	30	270	2180
50	2	16	220	1340
50	2	20	350	1650
50	2	30	350	2180
65	2 1/2	16	410	2380
65	2 1/2	20	410	2380
80	3	16	450	2600
80	3	20	450	4210
100	4	16	560	3450
100	4	20	560	5500

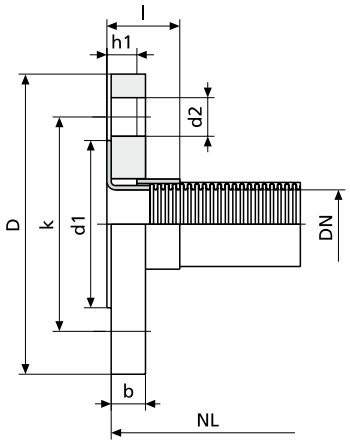
DN 65 and 80 for rated pressure 30 and all nominal diameters
Please inquire for rated pressure 40.

Connection pieces shape C DIN loose flange

Rated pressure 16
Materials: collar stainless steel, flange steel

DN	D	d1	k	b	d2	h1	l
10	90	40	60	14	14	9	24
15	95	45	65	14	1	9	24
20	105	58	75	14	14	12	27
25	115	68	85	16	14	15	35
32	140	78	100	16	18	15	35
40	150	88	110	16	18	17	37
50	165	102	125	16	18	23	43
65	185	122	145	16	18	23	43
80	200	138	160	18	18	23	50
100	220	158	180	18	18	28	53

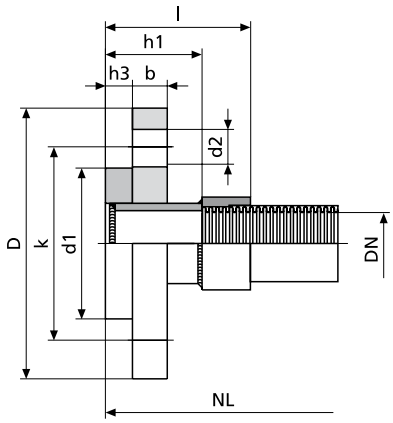
Loose flange PN 10/16 DIN 2642



Rated pressures 20 and 30
Materials: neck stainless steel, flange steel

DN	D	d1	k	b	d2	h1	l	h3
10	90	40	60	16	14	55	75	12
15	95	45	65	16	14	55	75	12
20	105	58	75	16	14	60	80	14
25	115	68	85	18	14	65	85	14
32	140	78	100	18	18	70	90	14
40	150	88	110	18	18	75	95	14
50	165	102	125	20	18	75	95	16
65	185	122	145	20	18	80	100	16
80	200	138	160	22	18	85	110	18
100	235	162	190	22	22	90	115	20

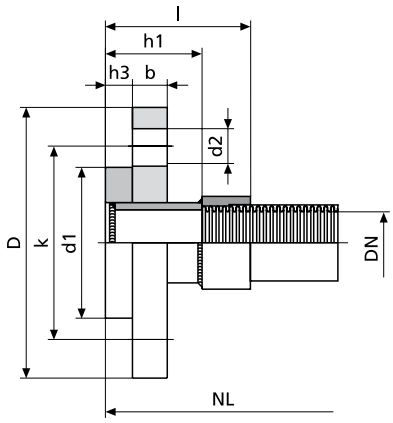
Loose flange PN 40 DIN 2656



Rated pressure 40
Materials: neck stainless steel, flange steel

DN	D	d1	k	b	d2	h1	l	h3
10	100	45	70	20	14	55	75	14
15	105	45	75	20	14	55	75	14
25	140	58	100	22	18	65	85	16
40	170	88	125	22	22	75	95	18
50	180	102	135	24	22	75	95	18
65	205	122	160	24	22	80	100	20
80	215	138	170	26	22	85	110	20

Loose flange PN 64 DIN 2636
(similar)



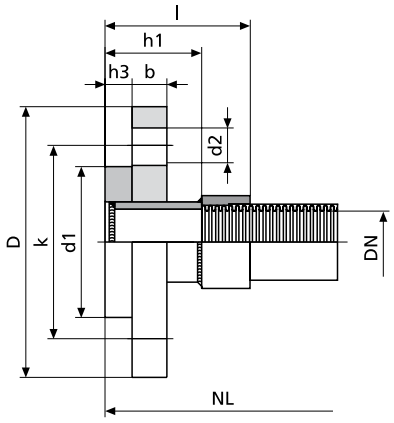
Look for flat packing on page 11.

Connection pieces shape D ANSI flange

Rated pressure 16
Materials: collar stainless steel, flange steel

DN	D	d1	k	b	d2	h1	l	h3
15	88,9	35,1	60,5	11,2	15,7	55	75	15,7
20	98,6	42,9	69,9	12,7	15,7	60	80	15,7
25	108	50,8	79,2	14,2	15,7	65	85	15,7
32	117,3	63,5	88,9	15,7	15,7	70	90	15,7
40	127	73,2	98,6	17,5	15,7	75	95	15,7
50	152,4	91,9	120,7	19,1	19,1	75	95	19,1
65	177,8	104,6	139,7	22,4	19,1	80	100	19,1
80	190,5	127	152,4	23,9	19,1	85	110	19,1
100	228,6	157,2	190,5	23,9	19,1	90	115	19,1

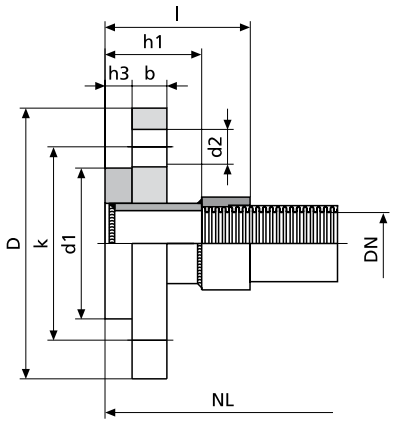
Loose flange ANSI 150 lbs



Rated pressures 20 and 30
Materials: neck stainless steel, flange steel

DN	D	d1	k	b	d2	h1	l	h3
15	95,2	35	66,5	14,2	15,7	55	75	14,2
20	117,3	42,9	82,5	15,7	19	60	80	15,7
25	123,9	50,8	88,9	17,5	19	65	85	17,5
32	133,3	63,5	98,5	19	19	70	90	19
40	155,4	73,1	114,3	20,6	22,3	75	95	20,6
50	165,1	91,9	127	22,3	19	75	95	22,3
65	190,5	104,6	149,3	25,4	22,3	80	100	25,4
80	209,5	127	168,1	28,4	22,3	85	110	28,4
100	254	157,2	200,1	31,7	22,3	90	115	31,7

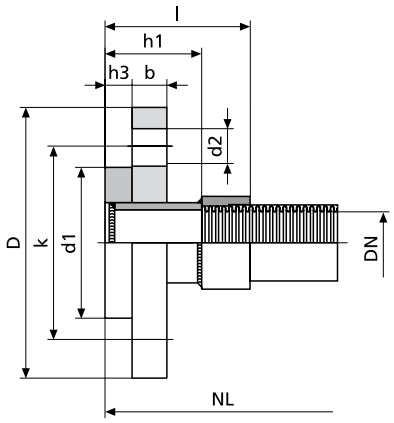
Loose flange ANSI 300 lbs



Rated pressure 40
Materials: neck stainless steel, flange steel

DN	D	d1	k	b	d2	h1	l	h3
15	95,3	35,1	66,5	14,2	15,7	55	75	14,2
20	117,3	42,9	82,6	15,7	19,1	60	80	15,7
25	124	50,8	88,9	17,5	19,1	65	85	17,5
32	133,4	63,5	98,6	20,6	19,1	70	90	20,6
40	155,4	73,2	114,3	22,4	22,4	75	95	22,4
50	165,1	91,9	127	25,4	19,1	75	95	25,4
65	190,5	104,6	149,4	28,4	22,4	80	100	28,4
80	209,6	127	168,1	31,8	22,4	85	110	31,8

Loose flange ANSI 400 lbs



For dimensions of flat packing,
please look at table 3 on page 16.

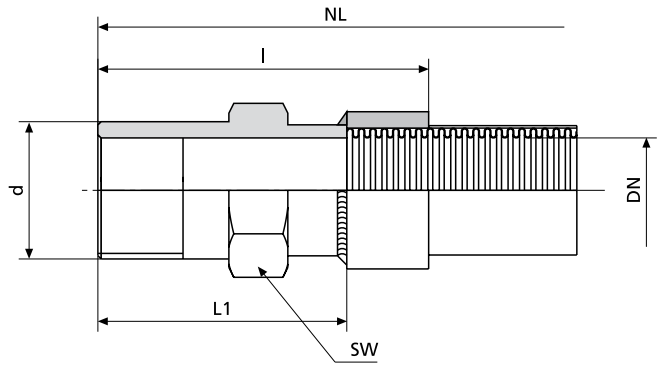
Connection pieces shape A

Whitworth pipe thread according to DIN 2999 conical

DN	d	Shape A			Weight
	DIN 2999	l	l1	SW	kg
6	1/4	35	25	17	0,02
10	3/8	43	28	19	0,04
12	1/2	46	31	22	0,05
15	1/2	46	31	22	0,06
20	3/4	47	32	27	0,09
25	1	60	40	36	0,14
32	1 1/4	63	43	46	0,23
40	1 1/2	66	46	50	0,25
50	2	70	50	60	0,43
65	2 1/2	80	60	80	0,65
80	3	100	75	95	0,75

Suitable for rated pressures 16 - 20 - 30 - 40.
Materials: malleable cast iron/steel

Nipple with hexagon and male thread



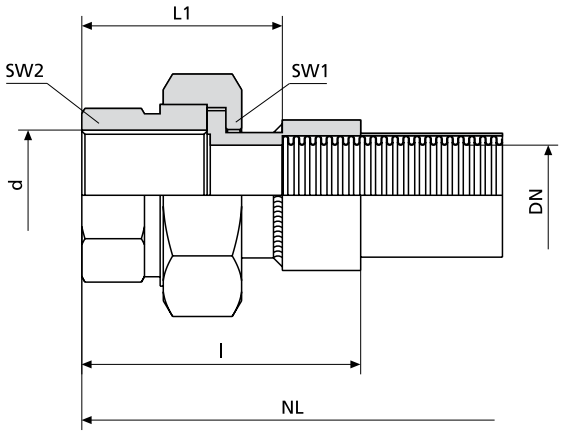
Connection pieces shape B

Whitworth pipe thread according to DIN 2999 cylindrical

DN	d	Shape B				Weight
	DIN 2999	l	l1	SW1	SW2	kg
6	1/4	55	45	28	18	0,11
10	3/8	57	47	32	22	0,14
12	1/2	69	54	39	26	0,18
15	1/2	69	54	39	26	0,19
20	3/4	74	59	48	31	0,31
25	1	84	64	54	38	0,42
32	1 1/4	87	67	67	48	0,68
40	1 1/2	91	71	73	54	0,87
50	2	102	82	90	66	1,31
65	2 1/2	122	102	110	85	1,78

Suitable for rated pressures 16 - 20 - 30 - 40.
Materials: malleable cast iron/steel

Screw connection with female thread, flat sealing



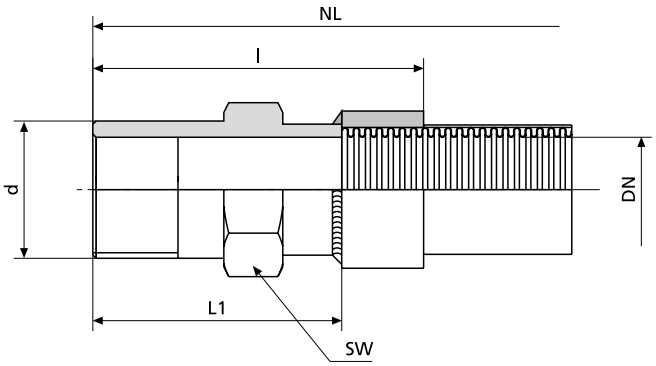
Connection pieces shape G

Thread NPT according to ASMI/ASME B 1.20.1-1983 conical

DN	d	Shape G		
		l	l1	SW
6	1/4	48	28	17
10	3/8	50	30	19
15	1/2	56	36	24
20	3/4	59	39	32
25	1	65	45	41
32	1 1/4	69	49	46
40	1 1/2	83	63	55

Suitable for rated pressures 16 - 20 - 30.
Materials: malleable cast iron/steel
Please inquire for greater nominal diameter.

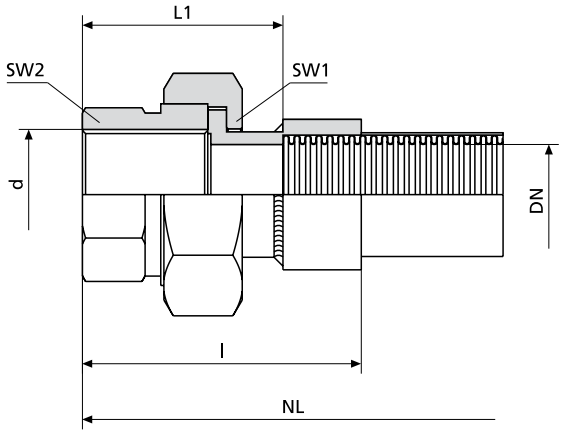
Nipple with hexagon
and male thread



Connection pieces shape F

Thread NPT according to ASMI/ASME B 1.20.1-1983 conical

Screw connection with female thread, flat sealing
Please inquire for dimensions and versions.



Special connections

Special connections at the metal hoses are possible.
Please inquire.

Examples:
- 90° elbow pieces
- weld ends
- fixed flange, etc.

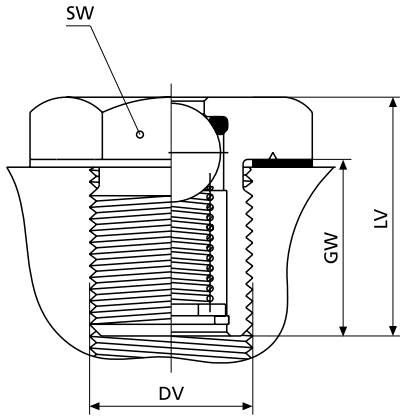
Materials
In addition to the standard materials steel and malleable cast iron, the connection pieces are also available in stainless steel.Possible materials include 1.4571. Please inquire for special metal hose materials.

Other Accessories

Vacuum Breakers

Material: brass

Vacuum breakers protect steam-heated rollers from damage caused by vacuum.
The vacuum breakers are available as separate units or built into the rotary joint (version 3).
The valve opens at a differential pressure of 0.3 bar.
Max. temperatures 160° and 200°C.

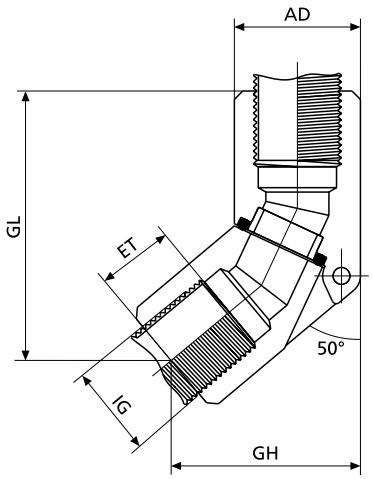


DV	G 1/2	G 1
Order No. Tmax. 160°C	1190010	1190020
Order No. Tmax. 200°C	1190010-231	1190020-232
LV	30	30
GW	22	19
SW	30	41
Order No. CU seal	3511954	3511962

Toggle joints

Material: brass

Toggle joints facilitate the installation of siphon pipes in steam-heated rollers, in particular in narrow, long trunnion bores.
Seals when bent. Max temperature 160°C.



IG	G 1/4	G 3/8	G 1/2	G 3/4	G 1	G 1 1/2	G 2
Order No.	1190100	1190110	1190120	1190130	1190140	1190150	1190160
Ø AD	22	25	30	36	45	60	80
ET	12	15	18	20	22	30	35
GL	42,5	56	63	70	74	108	138
GH	31	37,5	45	50	57,5	81	104

Lubrication Instructions for Rotary Joints

Series H/HW/HWA and DA do not require lubrication of the bearings. The slide bearings are self-lubricating, series DA is supported.

Rotary joints with rolling bearings are delivered with a filling of high-grade grease. Refer to the tables for lubrication intervals.

Relubrication intervals series DX, DP and M

Temperatures up to 80°C: lifetime lubrication by factory
80°C to 120°C: every six months
120°C to 140°C: every three months
140°C to 160°C: every 14 days

Nominal diameter rotary joint (DN)	10	15	20	25	32	40	50	65	80	100	125	150
Lubrication quantity in full strokes of a DIN 1283 grease gun (1 stroke approx. 1.2 cm)	3	4	5	6	8	10	15	20	35	50	70	100

Bearing grease Petamo GY 193 1 kg, Order No.: 3118216 Cartridge 400 ml.: 3118216-002

Relubrication intervals series DQL

DQL rotary joints are delivered with a filling of high-grade grease for high bearing temperatures. Relubrication only with the same grease.

Temperatures up to 150°C: every 4000 h
150°C to 200°C: every 1500 h
200°C and higher: every 750 h

Nominal diameter rotary joint (DN)	25	32	40	50	65	80	100	125	150
Lubrication quantity in full strokes of a DIN 1283 grease gun (1 stroke approx. 1.2 cm)	9	9	13	8	13	16	20	30	75

Bearing grease Turmotemp LP 5002 1 kg, Order No.: 3118219 Cartridge 400 ml.: 3118219-002
Do not use for centralized lubrication system.

Relubrication intervals series DC, DCL

DCL rotary joints with are delivered with a filling of high-grade Teflon grease for high bearing temperatures. Relubrication only with the same grease.

Temperatures up to 150°C: every 4000 h
150°C to 200°C: every 2000 h
200°C and higher: every 1000 h

Nominal diameter rotary joint (DN)	25	32	40	50	65	80	100	125
Lubrication quantity in full strokes of a DIN 1283 grease gun (1 stroke approx. 1.2 cm)	10	15	20	25	35	55	75	84

Bearing grease for Turmotemp LP 5002 1 kg, Order No.: 3118219 Cartridge 400 ml.: 3118219-002
Do not use for centralized lubrication system.

The rolling bearings used in the rotary joints require lubrication at regular intervals to ensure sufficient reliability of the rotary joint. Use only original greases. We shall not be liable for damages resulting from the use of greases not approved by us. Failure to observe the instructions and lubrication intervals may result in bearing damage.

Technical Appendix

General conversion factors

	Unit	Abbreviation	Conversion factor	Factor
Length	1 Inch	in	mm	25,4
	1 Millimeter	mm	in	0,03934
	1 Foot	ft	m	0,3048
	1 Meter	m	ft	3,28084
Area	1 Square inch	sq in	cm^2	6,4516
	1 Square centimeter	cm^2	sq in	0,155
Volumen	1 Gallon (UK)	gal	l	4,54596
	1 Liter	l	gal (UK)	0,219976
	1 Gallon (US)	gal	l	3,78533
	1 Liter	l	gal (US)	0,264177
Weight	1 Pound	lb	kg	0,453592
	1 Kilogram	kg	lb	2,204622
Torque	1 Pound per foot	lb/ft	kg/m	1,488164
	1 Kilogram per meter	kg/m	lb/ft	0,671969
Pressure	1 Pound per square-inch	psi	bar	0,06895
	1 Bar	bar	psi	14,5035
	1 Pound per square-inch	psi	Mpa	0,006895
	1 Mega Pascal	Mpa	psi	145,035
	1 Kilo Pascal	kPa	bar	0,01
	1 Bar	bar	kPa	100
	1 Mega Pascal	MPa	bar	10
	1 Bar	bar	MPa	0,1
Speed	1 Foot per second	ft/s	m/s	0,3048
	1 Meter pro Sekunde	m/s	ft/s	3,28084
Flow	1 Gallon per minute (UK)	gal/min	l/min	4,54596
	1 Liter per minute	l/min	gal/min (UK)	0,219976
	1 Gallon per minute (US)	gal/min	l/min	3,78533
	1 Liter pro Minute	l/min	gal/min (US)	0,264178
Temperature	Fahrenheit	°F	°C	5/9 (°F –32)
	Celsius	°C	°F	°C* 9/5 (+32)

(UK) = British unit
(US) = US unit

International material comparison

Mat. no.	DIN	AISI[1)]	UNS[2)]	SS[3)]	AFNOR[4)]	BS[5)]
1.4104	X 12 CrMoS 17	430 F	S 43020	2383	Z 10 CF 17	(441 S 29)
1.4301	X 5 CrNi 18 10	304	S 30400	2332	Z 6 CN 18.09	304 S 15
1.4401	X 5 CrNiMo 17 12 2	316	S 31600	2347	Z6 CND 17.11	316 S 16
1.4541	X 6 CrNiTi 18 10	321	S 32100	2337	Z 6 CNT 18.10	321 S 12
1.4571	X 6 CrNiMoTi 17 12 2	316 Ti	S 31635	2350	Z 6 CNDT 17.2	320 S 17

[1)] AISI = American Iron and Steel Institute
[2)] UNS = Unified Numbering System
[3)] SS = Swedish Standard
[4)] AFNOR = Association Francaise de Normalisation
[5)] BS = British Standard

Pressure table: saturated steam

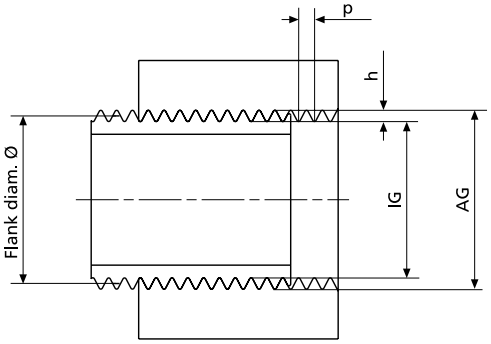
Specific values

Pressure		Temperature	Thermal capacity	Vaporization-heat	Thermal capacity	Steam volume	Steam density
Overpressure	Absolute press.	saturated steam t_s	water		steam		
p_e	p		h'	r	h"	ν"	ρ"
bar	bar	°C	kJ/kg	kJ/kg	kJ/kg	m^3/kg	kg/m^3
The overpressure relates to an absolute atmospheric (ambient) pressure of 1.000 bar.	0,01	7,0	29,34	2485	2514	129,2	0,0077
	0,05	32,9	137,8	2424	2562	28,19	0,0355
	0,1	45,8	191,8	2393	2585	14,67	0,0681
	0,2	60,1	251,5	2358	2610	7,650	0,1307
	0,3	69,1	289,3	2336	2625	5,229	0,1912
	0,4	75,9	317,7	2319	2637	3,993	0,2504
	0,5	81,3	340,6	2305	2646	3,240	0,3086
	0,6	86,0	359,9	2294	2654	2,732	0,3661
	0,7	90,0	376,8	2283	2660	2,365	0,4229
	0,8	93,5	391,7	2274	2666	2,087	0,4792
	0,9	96,7	405,2	2266	2671	1,869	0,5350
0	1,0	99,6	417	2258	2675	1,694	0,5904
0,1	1,1	102,3	429	2251	2680	1,549	0,6455
0,2	1,2	104,8	439	2244	2683	1,428	0,7002
0,3	1,3	107,1	449	2238	2687	1,325	0,7547
0,4	1,4	109,3	458	2232	2690	1,236	0,8088
0,5	1,5	111,4	467	2226	2693	1,159	0,8628
0,6	1,6	113,3	475	2221	2696	1,091	0,9165
0,7	1,7	115,2	483	2216	2699	1,031	0,9700
0,8	1,8	116,9	491	2211	2702	0,977	1,023
0,9	1,9	118,6	498	2206	2704	0,929	1,076
1,0	2,0	120,2	505	2201	2706	0,885	1,129
1,5	2,5	127,4	535	2181	2716	0,718	1,392
2,0	3,0	133,5	561	2163	2724	0,606	1,651
2,5	3,5	138,9	584	2147	2731	0,524	1,908
3,0	4,0	143,6	605	2133	2738	0,462	2,163
3,5	4,5	147,9	623	2120	2743	0,414	2,417
4,0	5,0	151,8	640	2107	2747	0,375	2,669
4,5	5,5	155,5	656	2096	2752	0,343	2,920
5,0	6,0	158,8	670	2085	2755	0,316	3,170
6	7	165,0	697	2065	2762	0,2727	3,667
7	8	170,4	721	2046	2767	0,2403	4,162
8	9	175,4	743	2029	2772	0,2148	4,655
9	10	179,9	763	2013	2776	0,1943	5,147
10	11	184,1	781	1999	2780	0,1774	5,637
11	12	188,0	798	1984	2782	0,1632	6,127
12	13	191,6	815	1971	2786	0,1511	6,617
13	14	195,0	830	1958	2788	0,1407	7,106
14	15	198,3	845	1945	2790	0,1317	7,596
15	16	201,4	859	1933	2792	0,1237	8,085
16	17	204,3	872	1921	2793	0,1166	8,575
17	18	207,1	885	1910	2795	0,1103	9,065
18	19	209,8	897	1899	2796	0,1047	9,555
19	20	212,4	909	1888	2797	0,0995	10,05
20	21	214,9	920	1878	2798	0,0949	10,54
24	25	223,9	962	1839	2801	0,0799	12,51
25	26	226,0	972	1829	2801	0,0769	13,01
29	30	233,8	1008	1794	2802	0,0666	15,01
30	31	235,7	1017	1785	2802	0,0645	15,51
39	40	250,3	1087	1713	2800	0,0498	20,10

Whitworth pipe thread as per DIN/ISO 228

Short: G

Cylindrical female thread, cylindrical male thread. Application: pipe thread for connection that does not seal in the thread.

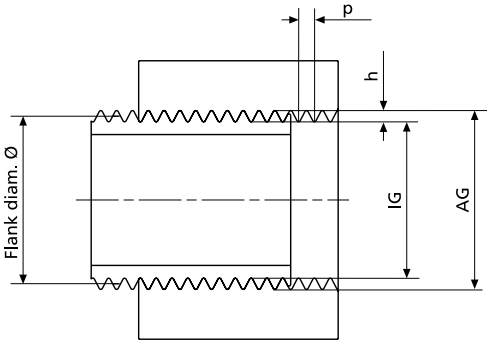


Thread	No. of turns	P	h	Max. outer diam. Ø for male thread AG	Flank diam. Ø	Min. core diam. Ø for female thread IG
G 1/8″	28	0,907	0,581	9,728	9,147	8,566
G 1/4″	19	1,337	0,856	13,157	12,301	11,445
G 3/8″	19	1,337	0,856	16,662	15,806	14,950
G 1/2″	14	1,814	1,162	20,955	19,793	18,631
G 5/8″	14	1,814	1,162	22,911	21,749	20,587
G 3/4″	14	1,814	1,162	26,441	25,279	24,117
G 1″	11	2,309	1,479	33,249	31,770	30,291
G 1 1/8″	11	2,309	1,479	37,897	36,418	34,939
G 1 1/4″	11	2,309	1,479	41,910	40,431	38,952
G 1 1/2″	11	2,309	1,479	47,803	46,324	44,845
G 1 3/4″	11	2,309	1,479	53,746	52,267	50,788
G 2″	11	2,309	1,479	59,614	58,135	56,656
G 2 1/4″	11	2,309	1,479	65,710	64,231	62,752
G 2 1/2″	11	2,309	1,479	75,184	73,705	72,226
G 2 3/4″	11	2,309	1,479	81,534	80,055	78,576
G 3″	11	2,309	1,479	87,884	86,405	84,926
G 3 1/2″	11	2,309	1,479	100,330	98,851	97,372
G 4″	11	2,309	1,479	113,030	111,551	110,072

Whitworth pipe thread as per DIN 2999

Short: Rp (female thread), R (male thread)

Cylindrical female thread, conical male thread. Application: pipe thread for connection that seals in the thread if sealing material is used.

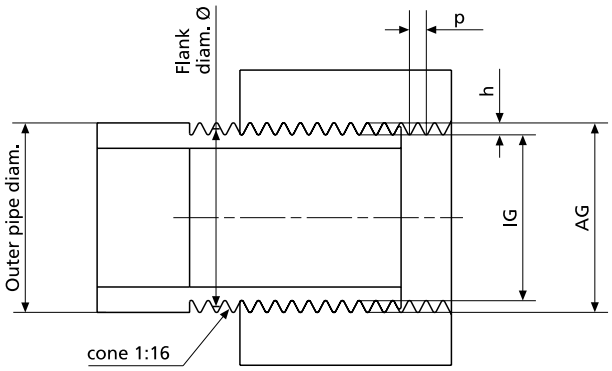


Male thread			Female thread		Outer pipe	No.	P	h	Outer	Flank	Core
DN	R		R	P	diam.	of turns			diam. Ø	diam. Ø	diam. Ø
6	R	1/8″	Rp	1/8″	10,2	28	0,907	0,581	9,728	9,147	8,566
8	R	1/4″	Rp	1/4″	13,5	19	1,337	0,856	13,157	12,301	11,445
10	R	3/8″	Rp	3/8″	17,2	19	1,337	0,856	16,662	15,806	14,950
15	R	1/2″	Rp	1/2″	21,3	14	1,814	1,162	20,955	19,793	18,631
20	R	3/4″	Rp	3/4″	26,9	14	1,814	1,162	26,441	25,279	24,117
25	R	1″	Rp	1″	33,7	11	2,309	1,479	33,249	31,770	30,291
32	R	1 1/4″	Rp	1 1/4″	42,4	11	2,309	1,479	41,91	40,431	38,952
40	R	1 1/2″	Rp	1 1/2″	48,3	11	2,309	1,479	47,803	46,324	44,852
50	R	2″	Rp	2″	60,3	11	2,309	1,479	59,614	58,135	56,656
65	R	2 1/2″	Rp	2 1/2″	76,1	11	2,309	1,479	75,184	73,705	72,226
80	R	3″	Rp	3″	88,9	11	2,309	1,479	87,884	86,341	84,926

American conical pipe thread according to ANSI/ASME B1.20.1-1

Short: NPT

Conical female thread, conical male thread. Application: pipe thread for connection that seals in the thread if sealing material is used.



Thread		Outer pipe diam.	No. of turns	P	h	Flank diam. Ø E_1	L_1	i
1/8″	NPT	10,287	27	0,941	0,753	9,489	4,102	6,703
1/4″	NPT	13,761	18	1,411	1,129	12,487	5,786	10,206
3/8″	NPT	17,145	18	1,411	1,129	15,926	6,096	10,358
1/2″	NPT	21,336	14	1,814	1,451	19,772	8,128	13,556
3/4″	NPT	26,670	14	1,814	1,451	25,117	8,611	13,861
1″	NPT	33,401	11 1/2	2,209	1,767	31,461	10,160	17,343
1 1/4″	NPT	42,164	11 1/2	2,209	1,767	40,218	10,668	17,953
1 1/2″	NPT	48,260	11 1/2	2,209	1,767	46,287	10,668	18,377

Christian Maier GmbH & Co. KG
Maschinenfabrik
89520 Heidenheim, Germany
Tel. +49 7321 317-0
Fax +49 7321 317-139
vkd@maier-heidenheim.de
www.maier-heidenheim.de

agentur-becker.de